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RECLAMATION & CLOSURE PLAN FOR THE DRUM MINE MILLARD COUNTY, UTAH

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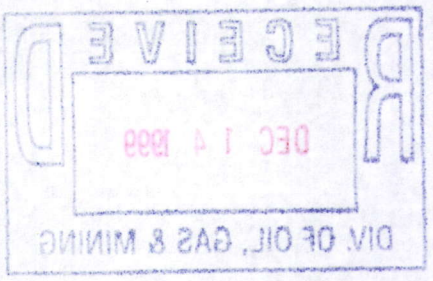
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RECLAMATION PLAN

INTRODUCTION

Western States Minerals Corporation (WSMC) considers reclamation and closure to be an integral and important component of the mining sequence. The reclamation and closure plan for the Drum Mine has been prepared to comply with the requirements of the Bureau of Land Management (BLM), the Utah Department of Natural Resources, Division of Oil, Gas and Mining (DOGM) and the Division of Water Quality (DWQ). The goals of the reclamation and closure plan are:

- Ensure public safety, reduce or eliminate adverse impacts, and to minimize unsightly visual impacts
- Minimize off-site impacts by controlling deleterious infiltration, erosion, sedimentation and related degradation of existing drainages.
- Return the disturbed areas to a stabilized condition similar to that which existed prior to mining activities.
- Re-establish a stable environment that will support a diverse self-sustaining vegetation and wildlife habitat, consistent with accepted land use objectives.
- Achieve a visual compatibility with the surrounding landscape.

The Drum Mine was a conventional gold heap leach operation, operated by WSMC from 1984 to October 1988 when it was sold to Jumbo Mining Company (E.B. King, President). Mine disturbances consisted of pits, heaps, dumps, ponds, plant site, access roads and drill holes and pads. The land package consisted entirely of unpatented mining claims on BLM ground. The major permits were a Notice of Intent filed with DOGM, and a Plan of Operations filed with the BLM. JUMBO was to have assumed all reclamation liabilities but a contractual dispute litigated for nine years resulted in split reclamation responsibilities. Pursuant to a "Settlement and Reclamation Agreement" dated April 13, 1998 between WSMC and the three agencies (the "Settlement Agreement"), WSMC agreed to perform reclamation on part of the site. After results of the sampling program were obtained and analyzed, the Agencies and WSMC reached agreement on the requirements of this final Reclamation and Closure Plan. In addition, to obtain efficiencies of operation and to assist the Agencies in the face of funding deficiencies, the split reclamation obligations have been re-allocated by agreement so that WSMC will perform the reclamation tasks allocated to it as set forth herein for the entire site. Finally, at the request of the Agencies and in consideration of additional funds paid to Western, Western has agreed to perform certain contractual services on behalf of the

BLM and DOGM at an additional area known as the Alto Pit in the manner described in Appendix G. This Reclamation and Closure Plan is submitted as an attachment to the First Amended Settlement Agreement.

TABLE #1

Drum Mine Reclamation/Closure Original Responsibility and Reclaimed Area (as per 4/13/98 Settlement Agreement)

Reclamation Responsibility	Area Description	Area Size (Acres)
WSMC	LG1	3.5
WSMC	LG2	17.9
WSMC	LG3	12.7
WSMC	HG6	5.0
WSMC	HG7	9.4
WSMC	W1	20.1
WSMC	W2	14.9
WSMC	W3	5.9
WSMC	W7	13.4
WSMC TOTAL	---	**102.8**
DOGM/JUMBO	HG1	11.5
DOGM/JUMBO	HG2	8.8
DOGM/JUMBO	HG3	8.1
DOGM/JUMBO	HG4&5	17.8
DOGM/JUMBO	W4	3.5
DOGM/JUMBO	SW EX PIT	19.5
DOGM/JUMBO	NR PIT	18.2
DOGM/JUMBO	POND/FACILITY	17.9
DOGM/JUMBO	OTHER	1.5
DOGM/JUMBO	**TOTAL**	**106.8**
WSMC & DOGM	SOIL BORROW	43.9
	SITE TOTAL	**253.5**

LOCATION

The Drum Mine is located in Millard County, approximately 35 miles northwest of Delta, Utah. The mine facilities are in sections 7 and 8 of T15S/R10W. Situated in the Drum Hills, the site is semi-arid with mean annual rainfall of 7.79 inches. There are no perennial streams on the property, and runoff is limited to periods of snowmelt and major storms. The elevation of the mine is from 5,800 to 6,300 feet with mean temperature of 50.1 degrees Fahrenheit. Please refer to Figure #1, Drum Mine Location Map.

POST MINING LAND USE

This reclamation and closure plan is designed to achieve post-mining land use consistent with those that existed prior to mining. These land uses include wildlife habitat, domestic grazing, diverse recreation, and mineral exploration and development. These objectives will be achieved by ensuring that affected areas are reclaimed to geotechnically and erosionally stable configurations capable of supporting a diverse, self-perpetuating plant community similar in appearance and function to nearby undisturbed areas.

RECLAMATION SCHEDULE

The proposed reclamation schedule is presented in Figure #2. Pursuant to the request of the parties involved, the schedule shown is one in which the entire mine is reclaimed. Though it would be possible for WSMC and JUMBO/DOGM to individually reclaim their respective areas of responsibility, the most efficient process in terms of time, money and materials is to complete the reclamation at one time. Therefore, a consolidated reclamation approach is the premise for this report. All financial estimations, equipment requirements, time requirements and supplies are based on completing reclamation for the whole site at one time. It is anticipated that reclamation activities would commence after this plan is approved, and when weather conditions allow for efficient equipment operation. Therefore, Figure #2 assumes a commencement of activities beginning the third or fourth quarter of 1999, and completion during year 2000 .

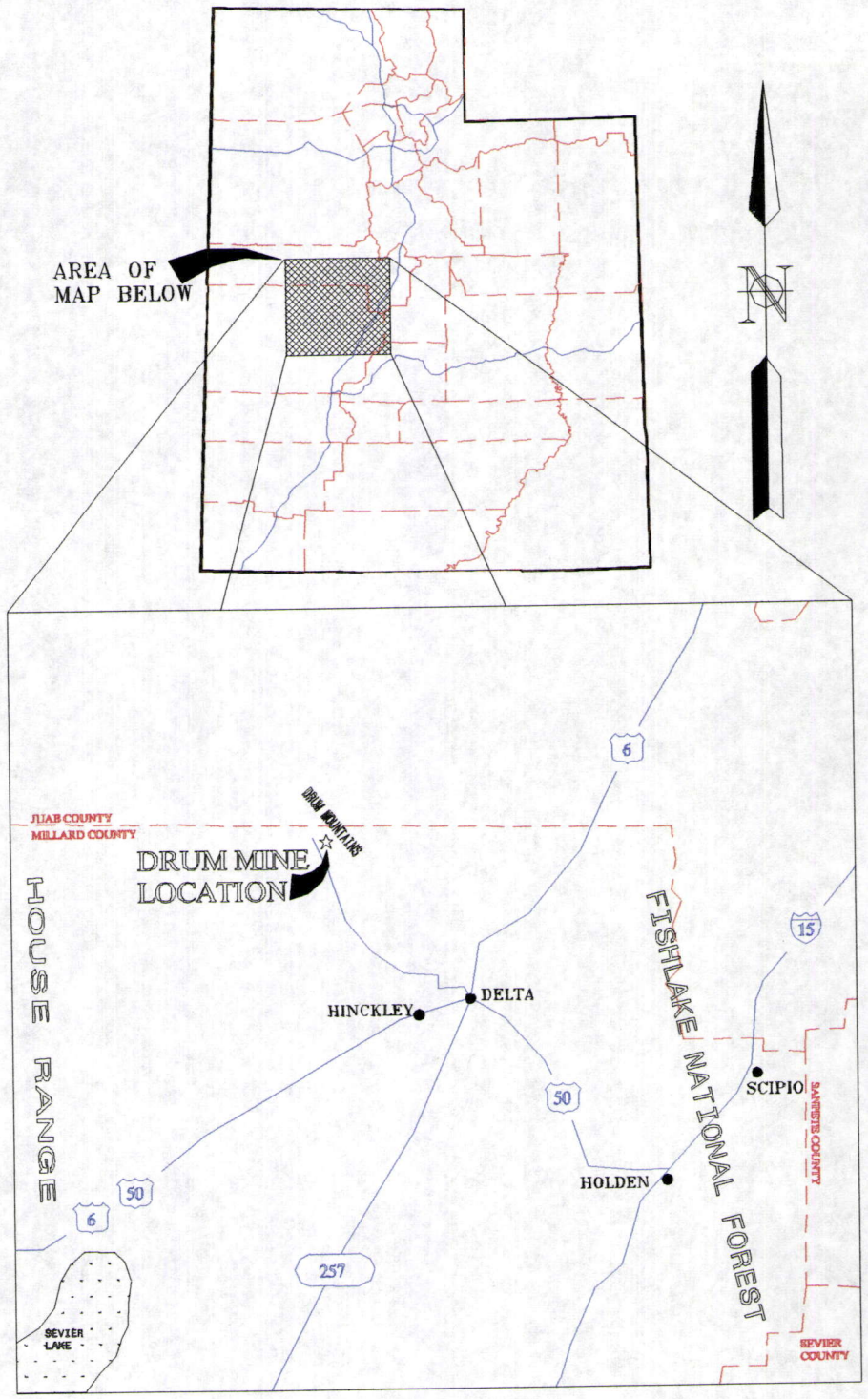


FIGURE #1
DRUM MINE LOCATION MAP

FIGURE #2
PROJECTED RECLAMATION SCHEDULE AND SEQUENCE

Task	Year of Drum Mine Reclamation			
	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter
Recontouring, Ripping				
Removal of Facilities, Demolition				
Growth Medium Application				
Drainage Construct				
Pit Perimeter Berm				
Fill Process Pond				
Grade Borrow Area				
Bio-solids & Seed				
Reclamation Monitoring *				

Note: * = Monitoring continues for a period of two years after reclamation has been completed.
Dashed lines indicate flexibility within the schedule.

The starting time is dependent on approval of the First Amended Settlement Agreement and this Reclamation and Closure Plan, and thus no specific starting date has been cited. The time required for each task is based on estimates to complete earthwork and related activities by a third party contractor. For the purposes of this document, reclamation is initiated in the beginning of November, but may be initiated earlier or later depending on approval and weather conditions, with completion estimated sometime around the middle of April. Total time to reclaim the lands is estimated at 5.5 months.

RECLAMATION APPROACH

Disturbed areas within the project boundary, except the SW EX Pit and NR Pit, will be reclaimed by regrading, applying growth media, fertilization (possibly using manure or other bio-solids), and seeding. Soil samples of the growth medium were collected and analyzed ensuring that the correct soil amendments will be used. Prior to recontouring any slopes with a grade greater than two or three horizontal feet to one vertical foot, all accessible soil will be removed from the toe of the slope, and either applied directly on a recontoured area or stockpiled for future use. Surface drainage will be reestablished throughout the property to minimize excessive overland flow and the resultant erosion of reclaimed areas. In general, all reclamation activities will be performed in accordance with the requirements of the BLM's Surface Management Regulations (e.g. as found in 43 CFR 3809) and DOGM's Mineral Regulatory Program (e.g. as found in the State of Utah Rule R647). Pursuant to Utah regulation R647-4-112, a request for variance from the open pit reclamation requirement of R647-4-111.7 will be made.

The waste dumps will be regraded to provide gentle transitions and remove sharp slope changes, thus blending into the surrounding topography. Following regrading, a layer of growth medium (soil) will be added and spread evenly across the regraded surface. Final waste dump slope angles are designed to be 2-3H:1V or flatter as established by field decisions made by designated representatives of Western and the Agencies. Some type of bio-solid (manure) will be added to the growth media prior to "dimpling" (roughening the surface by creating small depressions in order to enhance water collection) the surface and applying an approved seed mixture.

The heap leach pads will be reclaimed in a fashion similar to that used for the waste dumps. The heaps will be regraded to a maximum 2-3H:1V slope and shaped to eliminate the potential for standing water. Next, a layer of growth medium will be placed over the recontoured surface. Bio-solids will be added and the surface will then be "dimpled" and seeded. Diversion channels will be created, where needed, to convey potential run-on away from these reclaimed surfaces.

The underground mine openings (four (4) adits and one (1) glory hole) located in the bottom of the Southwest Extension Pit will be closed by backfilling using material from nearby sources within that pit.

All haul roads will be reclaimed by regrading, ripping compacted surfaces, replacing growth medium and revegetating the area. Regrading will, to the extent possible, restore the areas to pre-disturbance topography. Consultation with the BLM and DOGM indicate that no roads will remain, thus, all roads will be reclaimed.

All ancillary facilities will be demolished and removed prior to reclamation. Concrete foundations will be broken up to the extent possible and buried onsite. Other areas will be regraded and compacted surfaces will be ripped prior to application of growth medium and revegetated.

RECLAMATION PROCEDURES

Areas for final reclamation include the mine facilities site (the waste rock dumps and two open pits), and the processing facility sites (the heap leach pads, ponds and buildings). The final site topography will resemble that shown on Map 1 (found in the attached map pocket).

Regrading and Recontouring:

Regrading and or recontouring of the mine area will commence upon approval of the reclamation and closure plan and when weather conditions allow efficient equipment operation. The final reclaimed slope angle for the leach pads and waste rock dumps is anticipated to be approximately 2-3H:1V as established by field decision. A bulldozer will be the primary tool used to grade the areas to the design slope. Other areas of the mine site, which do not require recontouring, will be scarified in preparation for growth medium replacement.

Growth Medium Replacement:

After regrading to achieve the post-mining contours, the remaining disturbed areas with flatter surfaces will be ripped or scarified to eliminate areas of compaction. Next, approximately six (6) inches of suitable growth medium will be placed on all disturbed areas where it does not currently exist. The growth medium will be spread using a bulldozer, which will break up the medium minimizing clogging and compaction. All spreading operations will be conducted on the contour to minimize soil erosion. The final finished seedbed will result in a "dimpled" configuration. This will minimize erosion, optimize available soil moisture, and produce a soil surface appropriate for broadcast seeding. In addition to the existing stockpiled growth media (soil), an area of

approximately 44 acres will be disturbed in order to supply the total required growth media.

Revegetation will be performed to provide erosional stability, reduce infiltration by optimizing evapotranspiration, and establish a plant community consistent with the post-mine land uses. After final regrading of the heaps and waste rock dumps, approximately six (6) inches of suitable growth media will be placed over all disturbed areas where it does not currently exist. Bio-solids (manure) will be applied and incorporated into the upper substrate to add organic material and help increase the effective rooting depth of the new vegetation. After the bio-solids have been incorporated into the regraded surface, "dimpling" of the surface will occur to create small micro-ecosystems. Seed will be applied to all surfaces, during the "dimpling" process using a broadcast seeder attached to the "dimpling" machine.

The mine site has limited amounts of suitable growth medium available. In addition to the stockpiled growth media (soil), the proposed borrow areas (see Map 3, Topsoil/Growth Medium Areas) appear to contain the remaining required quantity of growth medium. The area disturbed during the process of obtaining the growth medium will be kept to a minimum. Every effort will be made to salvage any suitable growth medium, in the immediate vicinity, during the reclamation process. Enough growth media will be left in the borrow areas to revegetate those sites.

Revegetation and Stabilization:

Bio-solids (manure) will be applied to enhance the growth medium's fertility. Seedbed preparation will be completed during the addition of the bio-solids to the growth medium. Seedbed preparation will occur just before seeding to provide the highest probability for successful germination. The seed mixture will be composed of introduced annual and perennial plants adapted to the conditions of the area. Table #2, below, lists the seed mixture to be used.

During the post closure and reclamation period, revegetation will be monitored by the Agencies for herbaceous production, ground cover, and overall species diversity. If revegetation success has not been achieved the information obtained from monitoring will be used by the Agencies to identify alternative practical revegetation approaches to be incorporated into a revegetation program to be undertaken by the Agencies, as appropriate.

TABLE #2

REVEGETATION SEED MIXTURE

Species	Variety	PLS** lb./Acre	PLS/Square Feet
Crested Wheatgrass	Hycrest	2.0	10
Immigrant Kochia *	Immigrant	0.5	5
Alfalfa	Ladak	1.0	5
Fourwing Saltbush	Native	2.0	2
Wyoming Big Sagebrush *	None	0.1	12
Indian Ricegrass	Paloma	3.0	12
Intermediate Wheatgrass	Luna	2.0	8
Western Wheatgrass	Rosanna	2.0	??
Yellow Sweet Clover	None	0.5	??

** PLS-Pure Live Seed: * Current year crop, buy as late as possible.

DECOMMISSIONING OF FACILITIES

Upon closure, all remaining buildings and facilities will be dismantled and disposed of appropriately. Concrete foundations will be broken up and placed either in the mine waste dump and buried, or buried in place. Subsequent to the removal of all facilities, the facilities site will be graded to re-establish a suitable drainage pattern. The remaining synthetic liners in the process water ponds will be freed from their anchors, folded in on themselves and covered with fill material prior to the placement of topsoil and revegetation. The solution in the process ponds will be disposed by spraying and evaporation over HG1. The sediment in the two ponds will be left in place, encapsulated within the remaining liner, and buried.

Unless designated by the BLM for land management or recreation purposes, all roads will be closed and reclaimed following mine closure. The compacted roads will be ripped, graded and water-barred to permit suitable drainage and revegetation. The existing fencing around the property will remain until reclamation and revegetation have been determined to be successful. This perimeter fence will be maintained and posted throughout the revegetation monitoring period.

The BLM has assumed responsibility for the project water well and the microwave communications station. The water delivery pipeline has been sold and removed.

Storage tanks, which have not been sold, will be disposed of properly. Any hazardous materials found will be disposed of off site at an appropriate disposal facility in accordance with all applicable state and federal regulations for handling and disposal. Non-hazardous waste will be left in place.

DRAINAGE AND EROSION CONTROL

The Drum Mine site is located in an ephemeral drainage environment and water only flows during times of intense precipitation or during snow melt. Suitable drainage patterns through the mine site will be established in a manner that will minimize the potential for erosion and run-on to the reclaimed facilities. All drainage channels will be rip-rapped where appropriate and constructed in a manner as to minimize erosion. The side slopes of the heaps and waste rock piles will be recontoured to an approximate 2-3H:1V slope. This will allow the growth medium placed on these slopes to be disced along contour, and thus help prevent excess erosion and moisture loss. The use of other erosion control methods such as: the installation of silt fences, straw bales, mulch and energy dissipation boulders will be determined in the field at the time of reclamation.

SITE CHARACTERIZATION

Active leaching of all the heaps was discontinued in October 1990. Since that time, the heaps have sat idle. No known rinsing of the heaps, with fresh water, has taken place. Therefore, only meteoric water has come in contact with the heaps and waste dumps with no apparent adverse affects. In May and June of 1998, a site characterization sampling program was undertaken by WSMC and DOGM. The goal of the characterization program was to determine the characteristics of the spent ore heaps and waste dumps at the Drum Mine site. A sampling and testing program was developed and is attached in appendix A. Essentially, the program consisted of excavating small pits on the heaps and waste dumps and collecting samples every five feet. A total of 318 samples were collected from the heaps and 14 samples from the waste dumps. The solution and sediment in the process water ponds was also sampled. Nine (9) samples from the proposed growth medium borrow areas were also collected with assistance from DOGM. These samples were used to determine bio-solid and fertilizer requirements.

In order to thoroughly characterize the spent ore heaps and waste dumps, the following analytical procedures were performed:

- NDEP Meteoric Water Mobility Test (MWMT)
- Acid Generation/Acid Neutralization Potential
- EPA Profile II
- Wad Cyanide and Paste pH
- Permeability and Moisture Content

Laboratory testing results and summary tables are attached as Appendix B. All results confirm that the site is benign and does not pose a threat to the waters of the state.

DEMONSTRATION OF NON-DEGRADATION OF STATE WATERS

Approach:

The following steps were undertaken to clearly demonstrate that the conditions in which the spent ore heaps and waste dumps will be closed, will not create a potential for degradation of the waters of the state (R647-4-111).

- Constituent concentrations for each method of site characterization have been compared to drinking water standards (DWS) and best engineering practices to determine if a potential exists to degrade the water of the state.
- If constituent concentrations are less than the DWS or pass the best engineering practice test, then it is deemed that no degradation of state waters will occur.
- If constituent concentrations are greater than the DWS and fail to pass the best engineering practice test, a hydrologic evaluation will be conducted to determine the potential impacts of the constituents on the ground water beneath the heaps or waste dumps.

Analytical Results:

Analytical results from the site characterization sampling program are considered to be representative for the site and each heap and waste dump. These results, summarized in Tables B-1 through B-4 in Appendix B, indicate the following:

MWMT results (only exceedances are noted):

- pH was slightly elevated for LG2-2, HG1 (both samples), HG2 (both samples), HG4&5-2, HG7 (2 of 4 samples) where the highest value was 9.03 in HG1-1.
- Arsenic exceeded the DWS in HG1-1, HG3 (both samples), HG4&5-1, and HG7 (3 of 4 samples) where the highest value was 0.19 mg/l in HG7-3.
- Iron exceeded the DWS in LG2-1, LG2-2, HG1-1, HG3 (both samples), HG4&5)2 of 3 samples), HG6 (both samples), HG7 (2 of 4 samples). The highest value was recorded in HG6-1 at 2.1 mg/l.
- Lead exceeded the DWS in HG6-1 and HG7-1 where the highest value was 0.019 mg/l in HG6-1.

- Manganese exceeded the DWS in LG2-3 at 0.48 mg/l.
- Sulfate exceeded the DWS in LG2-3 at 400 mg/l.
- Results from the pregnant pond solids show that the DWS were exceeded for arsenic, chloride, manganese, sulfate and TDS. All concentrations were only minimally over the standard.
- Results from the barren pond solids show that the DWS were exceeded for pH, chloride, sulfate and TDS. The pond solids are mainly composed of lime, which accounts for the high pH and TDS. The other concentrations were only minimally above the standard.

EPA Profile II Results (only exceedances are noted):

- Results from the pregnant pond solution show that the DWS were exceeded for pH, arsenic, chloride, iron, lead, sulfate and TDS. All constituents, but chloride, sulfate and TDS, only minimally exceeded the standard.
- Results from the barren pond solution show that the DWS were exceeded for pH, chloride, fluoride, iron, sulfate and TDS. Only chloride and TDS were more than three times the standard.

Acid Generation/Acid Neutralization Potential (AG/ANP) Testwork:

The following sequence of waste testing was conducted on all samples to determine the presence and extent, if any, of net acid generating potential.

- Stage 1 Testing – Total sulfur was determined by Leco furnace method and the acid NP using acid titration. Results are expressed in terms of percent Calcium Carbonate Equivalent. Samples which have NP greater than three times the AP can be considered nonacid generating.
- Stage 2 Testing – Determine the sulfide sulfur content of the sample. Express the results in terms of percent Calcium Carbonate Equivalent. Samples that have a neutralization capacity (determined in Stage 1) greater than three times the sulfide sulfur content can be considered to be nonacid generating.
- Stage 3 Testing – Perform humidity cell testing, or the equivalent, and collect weekly leachate samples for analysis over a period of not less than one month. Use the results of the leachate analyses as an indicator of waste leachate characteristics.

AG/ANP results (only exceedances are noted):

- All but LG2-1 and LG2-3 passed the Stage 1 and Stage 2 testing. Due to the arid environment and low rainfall, the Stage 3 testing was not done. Results from the hydrologic evaluation also show that no leachate will be produced.

Hydrologic Evaluation:

Results of the hydrologic evaluation are shown in Appendix C, Tables C-1 through C-11. Due to the arid environment and relatively low rainfall, the hydrologic evaluation predicted no measurable leachate production from the heaps under the conditions simulated.

The evaluation method used the program, Hydrologic Evaluation of Landfill Performance, HELP Model Version 3.05a (June 5, 1996) (HELP3). Pertinent data used by the program includes weather data from the area, and soil and design data. The weather data (Table C-11) was obtained from station 422090 in Delta, Utah, approximately twenty five miles from the mine site. The weather data used was from the period 1978 to 1987, a ten (10) year time frame with 29% higher than average precipitation, thus simulating a worst case scenario. Table B-1 contains laboratory results for the heap material parameters: saturated hydraulic conductivity, porosity and field capacity. Wilting point was calculated using the ratio of initial and final moisture percentages and the calculated field capacity. Thus the wilting point for the heap material is essentially the initial moisture content. The growth medium data made use of the default parameters for a sandy loam.

Data from each section of a particular heap was averaged to get one set of parameters for that heap. Two scenarios were simulated: the first, was the recontoured heap without growth medium, and the second, was the recontoured heaps with six (6) inches of growth medium applied. Both simulations yielded no leachate, however, the scenario with the growth medium dramatically reduced the amount of water taken up by the heap.

RECLAMATION

Mine Pits:

It has been determined that it is not economically feasible to reclaim the SW EX and NR open pits; therefore, pursuant to R647-4-112, a request for exemption from the open pit reclamation requirements of R647-4-111-7 (Highwalls) inclusive, is being made.

At this time, backfilling all of the SW EX and NR open pits is not economically or practically feasible due to the associated costs and resulting environmental impacts. Backfilling the two pits would require the relocation of approximately 6 million cubic yards of material and would require several years to complete. Backfilling would require a significant investment in manpower, equipment, fuel and time. The extended time period required for backfilling may also contribute to continued impacts to other

resources, including air quality, groundwater consumption, wildlife, and livestock grazing and an increased consumption of non-renewable petroleum products.

Although present technologies do not provide an economically feasible method of recovering gold from low-content ores, future technologies may become available and additional mining may once again be feasible. If the pits are backfilled, future mining of the pits could not be accomplished in a cost effective manner. In addition, backfilling would remove evidence of remaining mineralization. Maintaining this evidence is allowed by the BLM's Surface Management regulations contained in 43 CFR 3809.

The open pits were designed to provide long-term stability. No post mining stabilization of the pit walls is proposed. The open pits were mined at slopes ranging from approximately 47 degrees to 30 degrees. Laying back the pit walls or other methods of mechanically altering the designed walls to obtain shallower slopes would be cost prohibitive and may not totally remove the unstable and unsafe conditions.

Public motorized access to the pits will be eliminated and an earthen berm will be constructed around the open pit highwall, to discourage unsafe access. The berm will be located so that any potential post-closure pit failure will not affect their integrity. The underground mine openings located in the bottom of the Southwest Extension Pit will be closed by backfilling using material from nearby sources within that pit.

An objective of this reclamation plan is to facilitate future mineral exploration and development in areas immediately surrounding and including this mine site. None of the reclamation activities proposed will adversely impact any future mining in the area.

Revegetation of the open pits will not be conducted except in areas of disturbance around the surface perimeter of the pit and all accessible ramps into the pits. Revegetation of these areas will be completed as described previously in the revegetation/stabilization section.

Waste Rock Storage:

The waste rock dumps occupy approximately 81.2 acres (includes LG1 heap which was never leached). These areas will be reclaimed by regrading to the final configurations shown on Map 1, Approximate Final Topography. This final reclamation configuration was developed to minimize regrading and to satisfy the design criteria. The design criteria were established to: 1) ensure the stability of the reclaimed slopes, 2) minimize erosion, and 3) provide surface configurations similar to the surrounding topography and suitable for successful revegetation.

The final reclamation configuration, as shown on Map 1, Approximate Final Topography, depicts an overall slope configuration of approximately 2-3H:1V. Prior to recontouring,

the additional area at the toe of the waste rock disposal sites, which will be covered due to sloping, will be cleared and grubbed. All material, including growth medium, will be salvaged and the shrubs will be piled up at the toe creating small animal habitat. All waste dumps will be reclaimed and closed as outlined in the Reclamation Procedure section.

Heap Leach and Processing Facility:

The heap leach pads occupy approximately 71.3 acres (excluding LG1 heap). The final reclamation configuration of the heap leach pads is shown on Map 1, Approximate Final Topography.

Both WSMC and the Agencies believe that the existing heaps can be classified as being detoxified and neutralized according to the BLM's standards. This conclusion is based on the results of the site characterization program done by both WSMC and DOGM. Results from the site characterization program indicate that the heap leach pads and solution ponds are detoxified and can be closed as proposed herein.

All side slopes will be regraded to achieve an overall slope configuration of approximately 2-3H:1V. The top surface of all the heaps will be shaped to eliminate the potential for standing water and minimize the potential for runoff down the side slopes. All heap leach pads will be reclaimed and closed as outlined in the Reclamation Procedure section.

During the regrading process, diversion channels will be constructed to collect and convey potential run-on away from the reclaimed areas. The channels will be designed to contain the precipitation from the 100-year 24-hour storm event. This regrading will enhance the blending of the heap leach pad with the surrounding topography by providing a smooth transition. The establishment of a revegetated surface over the heap leach pad, in conjunction with the high evaporation rate for the area, will significantly limit the amount of potential infiltration, and thus potential outflow. Based on the limited infiltration and the stable chemical composition of the heap material, no monitoring or collection of the outflow is anticipated or expected.

Process Ponds:

All ponds will be backfilled and regraded and the areas will be seeded. Impounded water and/or solutions in the process ponds or sediment pond that is present at the time of reclamation will be allowed or induced to evaporate or utilized in dust suppression. The solids on the bottom of the ponds have been analyzed and demonstrated to be benign. The accumulated solids will be encapsulated using the remaining liner and buried in place. The remaining pond liners and solids will be buried to a minimum depth of 5 feet

below the final reclamation surface. The pond areas will be backfilled and the surface graded to establish a reclaimed surface configuration approximately as shown on Map #1, Approximate Final Topography. The final reclaimed surface configuration will be designed to promote runoff.

Mine Facilities:

During the reclamation process all ancillary buildings and structures will be dismantled for disposal. Any remaining reagents will be returned to suppliers or properly disposed of off site. Non-salvageable items that are relatively inert, such as HDPE liner, concrete, and scrap building material and equipment will be buried on-site or disposed of off-site in compliance with state of Utah regulations. Equipment and building materials that have been in contact with cyanide or other toxic chemicals will be decontaminated prior to sale or disposal. Materials buried on site or removed to an off-site landfill will be disposed of in accordance with both state and federal regulations.

Concrete foundations, walls, and sumps will be broken up where possible and buried to a minimum depth of five feet so they do not interfere with the plant growth. Disturbed areas will be graded to blend with the natural topography and seeded. No visible structures will remain. Material contaminated with hazardous waste (if any) will be disposed of off-site at an approved landfill for hazardous materials, and will follow appropriate state and federal regulations. All mine facilities will be reclaimed and closed as outlined in the Reclamation Procedure section. All access roads will be reclaimed to the mine boundary. Access for monitoring purposes will be by foot, or with use of a small ATV.

Surface Water Diversions:

The diversion channels shown on Map 1, Approximate Final Topography, will be constructed to divert potential up gradient run-on and to direct runoff from reclaimed process facilities. Each channel will be constructed to contain precipitation from a 100-year, 24-hour storm event and to convey the flow away from the reclaimed surfaces, where possible, and into natural or re-established drainage channels.

Where possible, the diversion channels will follow natural contours at a slope of approximately 1.0%. Energy dissipation will be provided at channel outlets to reduce flow velocities and prevent surface erosion. Diversion channels will be protected using appropriately sized rip-rap and energy dissipation boulders to minimize surface erosion, where necessary.

Roads:

The Drum Mine area has approximately 2.2 acres of access roads, and 1.5 acres of additional roads not included as part of previously discussed reclaimed areas. All roads within the project boundary will be reclaimed during the reclamation process. Most of the roads will be reclaimed as part of the reclamation activities associated with the waste rock dumps and heap leach pads. Within the project boundary, the primary access road will be removed during the reclamation process as this road lies within the proposed growth medium borrow area. Any culverts will be removed during reclamation and the natural drainages will be re-established. All access and haul roads will be reclaimed and closed as outlined in the Reclamation Procedure section.

Landfill and Sanitary Wastes:

The permitted landfill site is located on the eastside of waste rock disposal site W1. The landfill will be reclaimed concurrently with W1. Special care will be taken to not disturb the landfill. The landfill will be covered with a minimum of five feet of material prior to application of the growth medium, bio-solids and seed. The septic system will be disconnected and piping will be sealed. This site will be reclaimed in a similar fashion as that described for the mine facilities.

Exploration:

Any open drill holes within the project boundary will be plugged pursuant to R647-4-108, inclusive. Holes, which encountered water, will be closed as per R647-4-108-2.12.112, filling from the bottom up (through the drill stem) with a high grade bentonite/water slurry mixture. .

WSMC shall also reclaim the disturbance around Busby Spring, an unplugged drill hole, and any other disturbances caused by exploration activities conducted under notices UT-057-39N, UT-056-64N, UT-056-062N and unserialized notices submitted December 13, 1983 and February 1, 1985.

The Mizpah area will be jointly reclaimed by WSMC and DOGM. The area consists of unplugged drill holes and unreclaimed access roads. The Mizpah area encompasses roughly 5 acres, all of which is not disturbed.

RECLAMATION MONITORING

Environmental and surface water monitoring of the project area after completion of the reclamation work described above will be the responsibility of the Agencies. Any repair or re-seeding of areas required after completion of the construction phase will similarly be the responsibility of the Agencies.

Ground Water Monitoring:

Based upon the results of the characterization data and the site conditions, no ground water monitoring is necessary.

RECLAMATION COST ESTIMATE

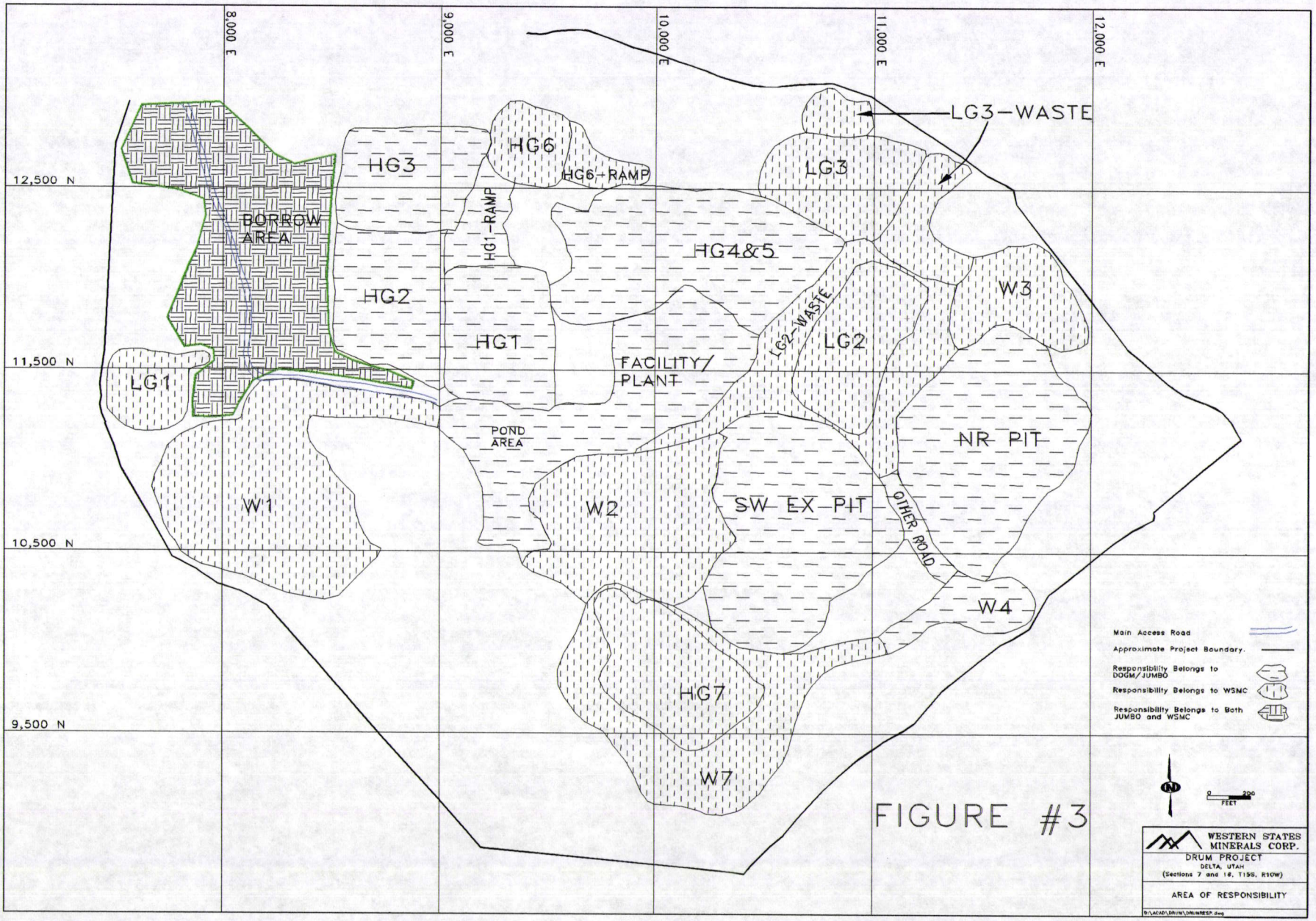
INTRODUCTION

The reclamation responsibility for the Drum Mine as originally agreed to by the BLM and DOGM was to be jointly split between Western States Minerals Corporation (WSMC) and DOGM, which was to conduct its reclamation work under bond forfeiture by JUMBO. The following table lists the areas of reclamation responsibility originally allocated between the two entities. Figure #3 and Map #2 show the areas for which each operator was originally responsible.

Reclamation Responsibility	Area Description	Area Size (Acres)
WSMC	LG1	3.5
WSMC	LG2	17.9
WSMC	LG3	12.7
WSMC	HG6	5.0
WSMC	HG7	9.4
WSMC	W1	20.1
WSMC	W2	14.9
WSMC	W3	5.9
WSMC	W7	13.4
WSMC TOTAL	---	**102.8**
DOGM/JUMBO	HG1	11.5
DOGM/JUMBO	HG2	8.8
DOGM/JUMBO	HG3	8.1
DOGM/JUMBO	HG4&5	17.8
DOGM/JUMBO	W4	3.5
DOGM/JUMBO	SW EX PIT	19.5
DOGM/JUMBO	NR PIT	18.2
DOGM/JUMBO	POND/FACILITY	17.9
DOGM/JUMBO	OTHER	1.5
DOGM/JUMBO	**TOTAL**	**106.8**
WSMC & DOGM	SOIL BORROW	43.9
	SITE TOTAL	**253.5**

WSMC currently maintains a reclamation performance bond in the amount of $264,080 and JUMBO maintained a reclamation performance bond in the amount of $143,000 for the Drum Mine and a separate reclamation performance bond in the amount of $19,000 for the Alto Pit. The amount of these bonds was based on prior estimated costs

associated with reclaiming the areas affected by existing mining activities. The existing bonds do not cover the current expected reclamation requirements, as outlined in this document. As specified in the First Amended Settlement Agreement, WSMC and the Agencies have agreed to re-allocate their original responsibilities so that WSMC will perform all construction activities at the site, DOGM will pay the entire JUMBO performance bonds and all accrued interest on such bonds to WSMC, plus contribute an additional $20,000 for closure of the underground workings, all to partially fund such activities, and the Agencies will perform any needed monitoring and post-construction phase activities as the means of completing their share of the tasks required at the site.


8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
LG3-WASTE
HG6
HG6-RAMP
HG3
LG3
BORROW AREA
HG1-RAMP
HG4&5
W3
HG2
HG1
LG2-WASTE
LG2
FACILITY/ PLANT
LG1
POND AREA
NR PIT
W1
W2
SW EX PIT
OTHER ROAD
W4
HG7
W7
Main Access Road
Approximate Project Boundary
Responsibility Belongs to DOGM/ JUMBO
Responsibility Belongs to WSMC
Responsibility Belongs to Both JUMBO and WSMC
N
0
200
FEET
FIGURE #3
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T15S, R10W)
AREA OF RESPONSIBILITY
D:\ACAD\DRUM\DRUMRESP.dwg

The purpose of this **Reclamation Cost Estimate** is to develop a realistic cost appraisal for an independent contractor to complete site reclamation. The cost estimate presented in this section is based on the planned final reclamation procedures presented in the preceding portion, **Reclamation Plan**, of this document.

COST SUMMARY

The following table is a summary of the costs associated with reclamation of the Drum Mine site. The following reclamation cost estimate reflects the estimated cost to reclaim 253.5 acres. Costs are based on actual bids submitted by prospective contractors. Four Contractors were asked to provide bids to reclaim the entire mine site. This included every task from removal and disposal of the remaining process facilities to final seeding. Only two prospective contractors responded to the request for bid. These were N. A. Degerstrom, Inc. and Robinson Construction. The request for bid package is attached as Appendix E. The low bid was used to estimate final reclamation costs. Copies of the two bids are attached in Appendix F.

WSMC COST ESTIMATION SUMMARY TABLE

Original Reclamation Responsibility	Area Description	Earthwork / Recontouring	Revegetate Stabilization	Reclamation Activities (Other)
WSMC	HG6	$8,902	$1,168	-
WSMC	HG7	$15,130	$3,328	-
WSMC	LG1	$5,008	$1,239	-
WSMC	LG2	$31,538	$2,797	-
WSMC	LG3	$23,269	$2,620	-
WSMC	W1	$62,987	$7,115	-
WSMC	W2	$28,382	$5,275	-
WSMC	W3	$9,528	$2,089	-
WSMC	W7	$42,312	$4,744	-
WSMC	HG6-RAMP	$3,315	$602	-
WSMC	LG2-WASTE	$16,960	$3,540	-
WSMC	LG3-WASTE	$7,673	$1,876	-
WSMC	BORROW	$4,388	$7,770	-
WSMC	DRAINAGE	$4,238	-	-
WSMC	DEBRIS DISPOSAL	-	-	$10,460
WSMC	FENCE INSTALL	-	-	$1,000
WSMC	MIZPAH	-	-	$4,340
WSMC	MOB – DEMOB	-	-	$45,000
WSMC	SUPERVISION	-	-	$19,915
WSMC	FINAL REPORT	-	-	$869
WSMC TOTAL	---	**$263,630**	**$44,163**	**$81,584**
Engineering & Contingency (10%) =		**$38,938**		

Total WSMC cost for Drum Mine reclamation as originally allocated: = $428,315

DOGM/JUMBO COST ESTIMATION SUMMARY TABLE

Original Reclamation Responsibility	Area Description	Earthwork / Recontouring	Revegetate Stabilization	Reclamation Activities (Other)
DOGM/JUMBO	HG1	$13,898	$3,044	-
DOGM/JUMBO	HG2	$12,981	$3,115	-
DOGM/JUMBO	HG3	$14,964	$2,867	-
DOGM/JUMBO	HG4&5	$24,479	$6,301	-
DOGM/JUMBO	HG1-RAMP	$3,513	$1,027	-
DOGM/JUMBO	W4	$4,323	$1,239	-
DOGM/JUMBO	SW EX PIT	$12,016	$1,735	-
DOGM/JUMBO	NR PIT	$10,691	$1,451	-
DOGM/JUMBO	POND/FACIL	$78,133	$6,337	-
DOGM/JUMBO	OTHER ROADS	$1,979	$531	-
DOGM/JUMBO	BORROW	$4,388	$7,770	-
DOGM/JUMBO	MONITORING	-	-	$5,785
DOGM/JUMBO	REMOVE FACILITY	-	-	$15,025
DOGM/JUMBO	HAZARD. MATL.	-	-	$3,220
DOGM/JUMBO	MIZPAH	-	-	$4,340
DOGM/JUMBO	MOB - DEMOB	-	-	$45,000
DOGM/JUMBO	SUPERVISION	-	-	$19,915
DOGM/JUMBO	FINAL REPORT	-	-	$869
DOGM/JUMBO	**TOTAL**	**$181,365**	**$35,417**	**$94,154**
Engineering & Contingency (10%)=		**$31,094**		

Total DOGM/JUMBO cost for Drum Mine reclamation as originally allocated:= $342,030

TOTAL DRUM MINE RECLAMATION: = $770,345

GENERAL METHODOLOGIES AND ASSUMPTIONS

In completing the reclamation calculations necessary to estimate total reclamation costs for the Drum Mine, the following details were employed:

- The maximum disturbance configuration as shown on Map 2, Current Topography, in conjunction with Map 1, Approximate Final Topography, were used to calculated areas, volumes and costs. Map 2, Current Topography, was developed by Olympus Aerial Survey from photographs taken July 22, 1987. Since the time of that survey, no additional significant disturbance has taken place.

- Equipment and labor costs for incidental work were taken from the contractor labor and equipment rental rates. Other costs associated to work not covered in the request for bid have been calculated using published references where available. The Mine and Mill Equipment Costs: An Estimator's Guide, (MEC) published by Western Mine Engineering, Inc, and "Means Heavy Construction Cost Data, 11th Annual Edition 1997", published by R. S. Means, Inc. were the primary cost references. Also used was the Mining Cost Service book published by Western Mine Engineering, Inc. for cost of materials. The objective in developing specific cost data has been to identify unit costs which are representative of those which would be incurred for final reclamation, given site conditions and prevailing economics for contract earthwork. Unit costs were adjusted as appropriate to reflect regional economic factors and project scheduling.

- Required reclamation functions were identified based on the nature and extent of disturbance included in this document as part of the Reclamation Plan.

- Effective drainage will be reestablished during final reclamation. Drainage reestablishment will involve grading to develop a suitable channel, slope reduction, construction of transitional slopes to tie into the existing natural drainages and use of rip-rap where appropriate.

- Growth medium volumes were determined using disturbed area acreage and replacement depth of six inches over all disturbed areas. Haul distances were measured from Map 3, Material Destination Map, which shows the soil borrow area and each disturbed area.

- Equipment productivities for each specific function were determined using standard references and representative grades and haulage distances. All productivity calculations for various equipment units are included in the individual cost detail calculations.

- Based on sampling of the heap material (all constituents including WAD cyanide were below NDEP profile II standards), no detoxification of the heaps will be necessary.

EARTHWORK/RECONTOURING

Volumes and Initial Calculations:

Volumes of material were calculated using Map 2, Current Topography, and Map 4, Original Topography. The total volume of ore, including both high grade and low grade, is calculated at 2,286,000 cubic yards. The total volume of waste rock removed is calculated to be 3,878,000 cubic yards. The following table outlines material volumes for each area:

AREA	MEASURED VOL(CU YD)	TOE AREA (SQ FT)	TOE LENGTH (FT)	CREST (SQ FT)	CREST LENGTH (FT)	CALC AVE HEIGHT (FT)
HG1	180,727	280,649	2,101	152,095	1,538	23
HG2	138,040	316,705	2,418	233,718	2,000	14
HG3	194,964	271,942	2,102	131,530	1,410	27
HG4&5	665,563	541,212	3,527	320,200	2,903	42
HG6	87,207	95,987	1,183	39,608	763	36
HG7	268,529	351,813	2,902	207,826	1,916	26
LG1	44,534	126,944	1,533	80,539	1,080	12
LG2	414,740	297,545	2,479	102,856	1,704	58
LG3	291,591	232,045	1,875	111,791	1,411	47
TOTAL ORE	2,285,895					

W1	804,756	675,332	4,175	482,078	2,478	60
W2	582,924	365,451	2,745	242,432	1,515	45
W3	212,788	213,387	2,052	121,301	1,216	20
W4	39,435	148,464	2,415	76,698	350	10
W7	1,165,981	75,588	3,671	460,622	1,912	55
HG1-RAMP	6,320	68,961	1,118	26,079	880	10
HG6-RAMP	16,114	58,995	1,258	19,978	491	20
LG2-WASTE	945,358	915,960	4,426	684,958	1,322	35
LG3-WASTE	104,622	228,119	2,704	73,542	522	30
TOT WASTE	3,878,298					

Salvage Growth Media before Slope Reduction:

Assumptions:

- Bid by Contractor.
- Final slope 3H : 1V or less, as determined by field decision reached by the designated representatives of Western and the Agencies.
- Total cost includes manpower and equipment costs, no material costs incurred.

AREA	SALVAGE LENGTH (FT)	SALVAGE WIDTH (FT)	SALVAGE AREA (ACRES)	SALVAGE DEPTH (FT)	BID PRICE ($)	UNIT PRICE ($/ACRE)
HG1	1,400	15	0.48	2	1,450	3,020
HG2	2,000	15	0.69	2	2,084	3,020
HG3	1,650	20	0.76	2	2,295	3,020
HG4&5	1,900	30	1.31	2	3,956	3,020
HG6	900	25	0.52	2	1,570	3,020
LG1	800	10	0.18	2	544	3,020
LG2	800	30	0.55	2	1,661	3,020
LG3	1,300	40	1.19	2	3,594	3,020
W1	2,400	40	2.20	2	6,644	3,020
W3	800	15	0.28	2	846	3,020
W4	200	5	0.02	2	60	3,020
W7	2,000	40	1.84	2	5,557	3,020
HG6-RAMP	700	15	0.24	2	725	3,020
TOTAL					$30,986	3,020

Slope Reduction, Dumps (Waste Rock) & Heaps (Ore Material):

Assumptions:

- Bid by Contractor.
- Final slope 3H : 1V or less
- Total cost includes manpower and equipment costs, no material costs incurred.

AREA	CREST LENGTH (FT)	AVERAGE HEIGHT (FT)	AVE PUSH DISTANCE (FT)	VOLUME TO MOVE (LCY)	BID PRICE ($)	UNIT PRICE ($/LCY)
HG1	1,538	23	32	8,601	3,010	0.35
HG2	2,000	14	20	3,481	1,218	0.35
HG3	1,410	27	38	10,862	3,802	0.35
HG4&5	2,903	42	59	54,189	18,966	0.35
HG6	763	36	50	10,456	3,660	0.35
HG7	1,916	26	36	13,696	4,794	0.35
LG1	1,080	12	17	1,640	574	0.35
LG2	1,704	58	81	60,650	21,227	0.35
LG3	1,411	47	66	32,976	11,542	0.35
W1	2,478	60	84	94,439	33,054	0.35
W2	1,515	45	63	32,488	11,371	0.35
W3	1,216	20	28	5,134	1,797	0.35
W4	350	10	14	376	132	0.35
W7	1,912	55	77	61,184	21,414	0.35
HG1-RAMP	880	10	14	945	331	0.35
HG6-RAMP	491	20	28	2,073	725	0.35
LG2-WASTE	1,322	35	49	17,137	5,998	0.35
LG3-WASTE	522	30	42	4,969	1,739	0.35
TOTAL					$145,354	0.35

Ripping:

Assumptions:

- All compacted surfaces will be ripped prior to growth medium material replacement.
- Ripping depth will be 18 inches.
- Ripping will be completed by a Contractor.

Cost Estimate Summary - Ripping

AREA	ACREAGE	BID PRICE ($)	UNIT PRICE ($/ACRE)
W1	9.4	1,203	128
W2	5.4	691	128
W3	3.0	384	128
W4	2.2	282	128
W7	5.1	653	128
LG3-RAMP	1.2	154	128
SW EX PIT	4.9	627	128
NR PIT	4.1	525	128
POND/FACILITY	17.9	2,291	128
OTHER - ROADS	2.5	320	128
TOTALS	**55.7**	**$7,130**	**128**

Growth Medium Placement:

Assumptions:

- Average depth of growth medium is six (6) inches.
- Growth Medium will be obtained from the borrow area and stockpiles located around the site (See Map 1, Approximate Final Topography).
- The haulage distances and grades were determined from Map 3, Material Destination Map, and given to the Contractor.

HAUL AND SPREAD GROWTH MEDIA

AREA	ACREAGE	VOLUME (LCY)	DISTANCE TO BORROW (FT)	BID PRICE ($)	UNIT PRICE ($/LCY)
HG1	8.6	6,940	2,998	9,438	1.36
HG2	8.8	7,120	2,085	9,683	1.36
HG3	8.1	6,520	2,258	8,867	1.36
HG4&5	17.8	14,380	4,564	19,557	1.36
HG6	3.3	2,700	3,539	3,672	1.36
HG7	9.4	7,600	3,574	10,336	1.36
LG1	3.5	2,860	931	3,890	1.36
LG2	7.9	6,360	4,874	8,650	1.36
LG3	7.4	5,980	5,125	8,133	1.36
W1	20.1	16,240	2,526	22,086	1.36
W2	14.9	12,000	3,173	16,320	1.36
W3	5.9	4,780	4,910	6,501	1.36
W4	3.5	2,830	4,440	3,849	1.36
W7	13.4	10,800	3,749	14,688	1.36
HG1-RAMP	2.9	2,340	2,310	3,182	1.36
HG6-RAMP	1.7	1,390	3,100	1,890	1.36
LG2-WASTE	10	8,060	4,991	10,962	1.36
LG3-WASTE	5.3	4,250	4,744	5,780	1.36
SW EX PIT ROAD	4.9	3,940	4,089	5,358	1.36
NR PIT ROAD	4.1	3,280	5,416	4,461	1.36
POND/FACILITIES	17.9	4,810	500	6,542	1.36
OTHER - ROADS	1.5	1,220	3,888	1,659	1.36
TOTAL	180.9	136,400		$185,504	1.36

Miscellaneous Earthwork:

Assumptions:

- Material weight estimated at 2970 lb./loose cu yd.
- The construction of a new Landfill on W1.
- Drainage channels are 6 feet wide by 3 feet deep V-trenches.
- Material to fill process ponds will come from W2.
- Surface will be prepared to WSMC/DOGM's satisfaction prior to seeding.

MISCELLANEOUS EARTHWORK

TASK	ACREAGE	VOLUME (LCY)	TIME (HRS)	BID PRICE ($)	UNIT PRICE ($)
ESTABLISH DRAINAGE CHANNELS			52	8,476	$/HR 163.00
CONSTRUCT PIT PERIMETER BERMS			72	11,736	$/HR 163.00
FILL AND CONTOUR PROCESS PONDS	4.5	66,000		69,300	$/LCY 1.05
REMOVE OLD CONCRETE FOUNDATIONS	4500 SQ. FT.			11,475	$/SQFT 2.55
SCARIFY ALL REMAINING COMPACTED AREAS	45			8,775	$/ACRE 195
DISPOSE OF ALL REMAINING REFUSE				4,250	$/DAY 425
HAUL AND SPREAD 2 TONS/ACRE MANURE	254			16,256	$/ACRE 64.0
PREPARE SURFACE & SPREAD SEED	254			38,100	$/ACRE 150.
TOTAL	557.5	66,000	124	168,368	NA

The per foot cost for constructing the drainages and pit perimeter berms were deemed high. In order to estimate the cost, the labor and equipment rates for extra work were used. The contractor bid price for an excavator is $135/hr and the operator costs $28/hr. Using these costs and an estimated production of 100 feet per hour for both the drainages and perimeter berms, the total cost was calculated.

The adits (4) and glory hole in the bottom of the Southwest Extension will be backfilled using a trackhoe, a dozer and small dump truck and loader. This task will be completed using additional funds supplied by the Abandoned Mines Lands Division of DOGM.

Earthwork / Recontouring Cost Estimate Summary:

A cost estimate summary for the earthwork and recontouring phase for the Drum Mine site is presented in the following table. Costs include manpower, equipment and any material costs incurred.

COST SUMMARY - EARTHWORK / RECONTOURING

AREA	SALVAGE GROWTH MEDIUM	SLOPE REDUCTION	RIPPING	PLACE GROWTH MEDIUM	DRAINAGE CONST.	PIT BERM	FILL PROCESS PONDS	TOTAL
HG1	$1,450	$3,010	-	$9,438	-	-	-	$13,898
HG2	$2,080	$1,218	-	$9,683	-	-	-	$12,981
HG3	$2,295	$3,802	-	$8,867	-	-	-	$14,964
HG4&5	$3,956	$18,966	-	$19,557	-	-	-	$24,479
HG6	$1,570	$3,660	-	$3,672	-	-	-	$8,902
HG7	-	$4,794	-	$10,336	-	-	-	$15,130
LG1	$544	$574	-	$3,890	-	-	-	$5,008
LG2	$1,661	$21,227	-	$8,650	-	-	-	$31,538
LG3	$3,594	$11,542	-	$8,133	-	-	-	$23,269
W1	$6,644	$33,054	$1,203	$22,086	-	-	-	$62,987
W2	-	$11,371	$691	$16,320	-	-	-	$28,382
W3	$846	$1,797	$384	$6,501	-	-	-	$9,528
W4	$60	$132	$282	$3,849	-	-	-	$4,323
W7	$5,557	$21,414	$653	$14,688	-	-	-	$42,312
HG1-RAMP	-	$331	-	$3,182	-	-	-	$3,513
HG6-RAMP	$700	$725	-	$1,890	-	-	-	$3,315
LG2-WASTE	-	$5,998	-	$10,962	-	-	-	$16,960
LG3-WASTE	-	$1,739	$154	$5,780	-	-	-	$7,673
SW EX PIT	-	-	$627	$5,358	-	$6,031	-	$12,016
NR PIT	-	-	$525	$4,461	-	$5,705	-	$10,691
POND/FACIL	-	-	$2,291	$6,542	-	-	$69,300	$78,133
OTHER ROADS	-	-	$320	$1,659	-	-	-	$1,979
BORROW	-	-	$8,775	-	-	-	-	$8,775
MISC	-	-	-	-	$8,476	-	-	$8,479
TOTAL	$30,957	$145,354	$15,905	$185,504	$8,476	$11,736	$69,300	$467,232

REVEGETATION / STABILIZATION

Bio-solids, Seed Application and Medium Sampling:

Assumptions:

- Soil sampling costs were allocated in the site characterization program.
- No chemical fertilizer will be applied.
- Application of seed will be by mechanical broadcasting.
- Seed bed preparation will be completed during the spreading of growth medium.
- Seed application cost equals $150.00 per acre.
- Seed cost per acre is $140.00 (Quote from Plummer Seed Co.).

Bio-solid Application:

Assumptions:

- Use 2 ton/acre of manure. .
- Manure will be applied by use of a spreader truck.

Cost per Acre: $64.00

Cost Per Acre - Revegetation / Stabilization:

Total cost per Acre: $354.00

Cost Summary - Revegetation / Stabilization

AREA	ACREAGE	COST ($)
HG1	8.6	$3,044
HG2	8.8	$3,115
HG3	8.1	$2,867
HG4&5	17.8	$6,301
HG6	3.3	$1,168
HG7	9.4	$3,328
LG1	3.5	$1,239
LG2	7.9	$2,797
LG3	7.4	$2,620
W1	20.1	$7,115
W2	14.9	$5,275
W3	5.9	$2,089
W4	3.5	$1,239
W7	13.4	$4,744
HG1-RAMP	2.9	$1,027
HG6-RAMP	1.7	$602
LG2-WASTE	10	$3,540
LG3-WASTE	5.3	$1,876
SW EX PIT ROAD	4.9	$1,735
NR PIT ROAD	4.1	$1,451
POND/FACILITIES	17.9	$6,337
OTHER - ROADS	1.5	$531
BORROW	43.9	$15,541
TOTAL	224.8	$79,581

RECLAMATION MONITORING

Vegetation Monitoring:

Assumptions:

- One inspection at the end of 2 years from completion of reclamation.
- 2 person crew of vegetation specialists from Salt Lake City, Utah consulting firm.
  - Reclamation (vegetation) specialist @ $85/hr
  - Reclamation technician @ $55/hr
- 3 day field visit for 2-persons
- 2 days for reclamation specialist to write report.
- 1 day of word processor time @ $30/hr.
- Pickup truck @ $0.35/mile
- Approximately 330 mile round trip, Salt Lake City to Delta.
- Approximately 70 mile round trip, Delta to Drum Mine site.
- 2 nights @ Delta Motel

Manpower:

Reclamation Specialist:	
1 x ($85/hr) x (5 days) x (8 hr/day)	= $3,400
Reclamation Technician:	
1 x ($55/hr) x (3 days) x (8 hr/day)	= $1,320
Word Processor:	
1 x ($30/hr) x (1 day) x (8 hr/day)	= $ 240
Total	= $4,960

Equipment /Travel:

Pickup Truck:	
1 x (470 miles) x ($0.35/mile)	= $ 165
Motel:	
1 x (2 people) x (2 nights) x ($50/night)	= $ 200
Meals:	
1 x (2 people) x (3 days) x ($35/day)	= $ 210
Total:	= $ 575

Materials:

Assume $250/yr in supplies, postage, and telephone	
1 x ($250/yr)	= $ 250

Total cost for Reclamation Monitoring:

Total Cost:	=**$5,785**

FACILITIES REMOVAL

Assumptions:

- Only large diameter leach lines will be removed and buried.
- Small diameter leach lines will be buried in place.
- All water tanks and the main water line have been sold and removed.
- All buildings, power poles and useable equipment have been sold and removed.
- Only minor debris remains to be picked up and placed in the on site landfill.
- Responsibility for the water well will be assumed by the BLM.
- Responsibility for the microwave station will be assumed by the BLM.

Cost to remove remaining debris will be split 60/40 between DOGM and WSMC respectively. This split is due to the distribution of debris at the site according to areas of responsibility.

Cost to remove all remaining debris:	$ 4,250
Cost to remove remaining concrete foundations:	$11,475

Cost to dispose/recycle the tires (103 total) around the site will be borne by WSMC. The cost is estimated at $8,760, which was obtained from Utah Tire Recyclers located in West Valley City, Utah.

Cost to install fence that has been removed due to sloping and growth medium salvage is estimated at $1.00 per foot for a four strand barbwire fence. The estimated total length of fence, which will need to be replaced, is 2,000 feet. Cost will be evenly split between WSMC and DOGM.

Cost to install new fence:	$2,000

Hazardous Material Disposal:

The Drum mine site contains a number of containers, which contain hazardous material. The bulk of the material is oil. The BLM had Rinchem sample and analyze all the drums and other containers on the site. Rinchem recorded the following: 9-55 gallon drums with oil, 5-5 gallon containers with oil, 3-20 gallon containers with oil, 8-55 gallon drums with some oil, sludge and water, 16-35 gallon drums containing CaCl and 1-5 gallon barrel of chemical drilling mud. Rinchem also found an undisclosed number of containers containing water or diesel fuel. The BLM also found at the well site and auxiliary pumping stations several barrels containing oil and water. The area around the well and pumping stations had indications of oil spills. There are also, several areas around the old mine facilities where an indication of oil spillage has occurred. All

hydrocarbon contaminated soil will be removed according to state and federal regulations.

Assumptions:

- All containers containing oil will be accepted by an oil recycler.
- The county of Millard will take the 16-35 gallon drums of CaCl.
- The diesel fuel will be taken by the person who purchased the process building.
- All excavated hydrocarbon contaminated soil will be permanently placed on one of the waste dumps.
- Costs are based on quote from Americlean Inc., Silver Springs, NV.
- Rinchem will provide all testing paper work so the recycler will not need to re-test the containers.
- 580 gallons oil only and 605 gallons oil, sludge and water.
- A total of 475 cu yds. of hydrocarbon contaminated soil.

Waste Oil Disposal Costs:

$0.25 per gallon for oil only
$1.40 per gallon for oil, water and sludge
$65.00 per hr for transportation

(580 gallons oil) x ($0.25/gallon)	= $ 145
(605 gallons oil, sludge and water) x ($1.40/gallon)	= $ 847
(16 hrs transportation) x ($65.00/hour)	= $1,040
Total Cost:	= $2,032

Contaminated Soil Disposal Costs:

$2.50 per cubic yard to haul to W1 waste dump.

(475 cu yds X $2.50/cu yds)	=$1,188
Total Cost for Hazardous Material Disposal:	**=$3,220**

MIZPAH EXPLORATION AREA

Assumptions:

- A total of 175 drill holes to be plugged.
- Costs will be split evenly between WSMC and DOGM.
- Only those areas that have heavy road cuts will be reclaimed. All other areas will be ripped to remove compaction, seeded and left as is.
- Estimated total area of roads is 4.6 acres.
- Estimated area to be re-seeded is ½ total area or 2.3 acres.

Cost to plug one drill hole is 35$: (175 X $35)	=$ 6,125
Time to reclaim roads is estimated at 24 hrs.	
($51.00/hr Cat 325 excavator X 24 hrs)	=$ 1,224
($21.00/hr Operator X 24 hrs)	=$ 504
Time to seed roads is estimated at 16 hrs.	
($21.00/hr backhoe to scarify X 8 hrs)	=$ 168
($21.00/hr labor to seed X 16 hrs)	=$ 336
($140/acre for seed X 2.3 acres)	=$ 322
Total Mizpah Reclamation Cost	**=$8,679**

REFERENCES

Caterpillar, Inc. 1994. Caterpillar Performance Handbook, edition 25. Peoria, Illinois.

R.S. Means Co., Inc. 1997. Heavy Construction Cost Data, 11th Annual Edition. Kingston, Massachusetts.

USDI, BLM, Surface Management Regulations, 43 CFR 3809

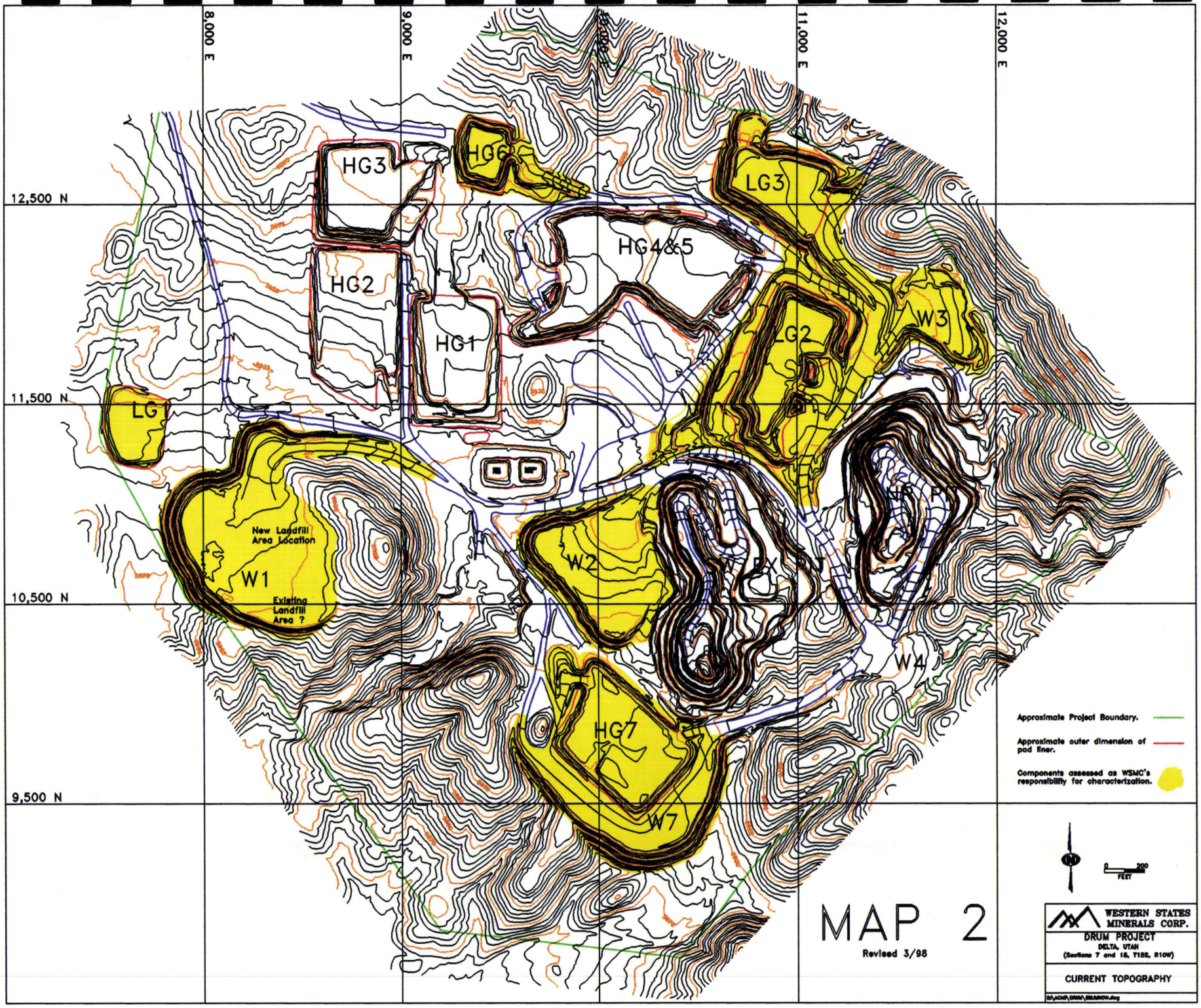
Utah Rule R647., Natural Resources; Oil, Gas and Mining; Non-coal. Minerals Regulatory Program.

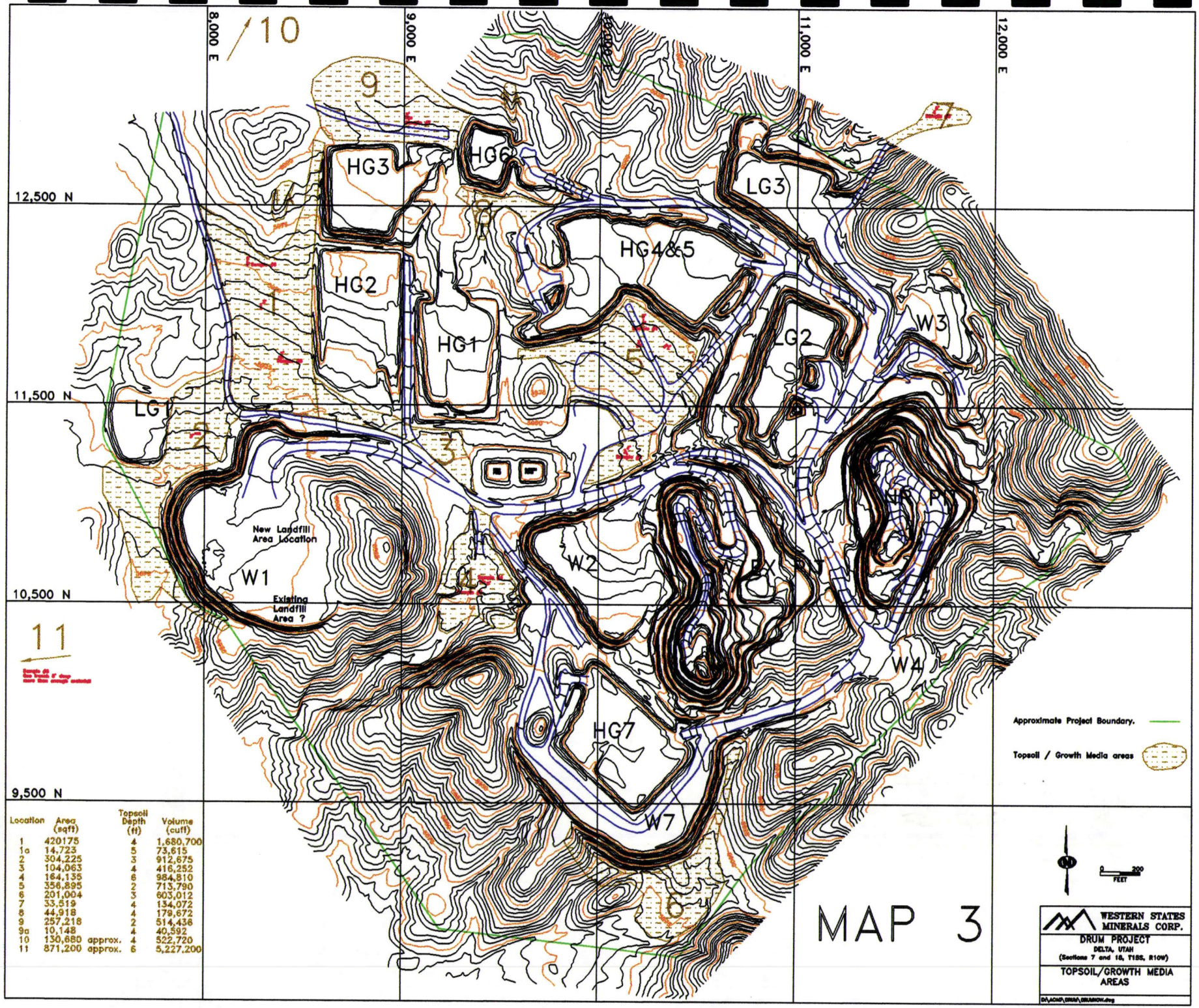
Western Mine Engineering, Inc. 1997. Mining Cost Service. Spokane, Washington.

MAPS

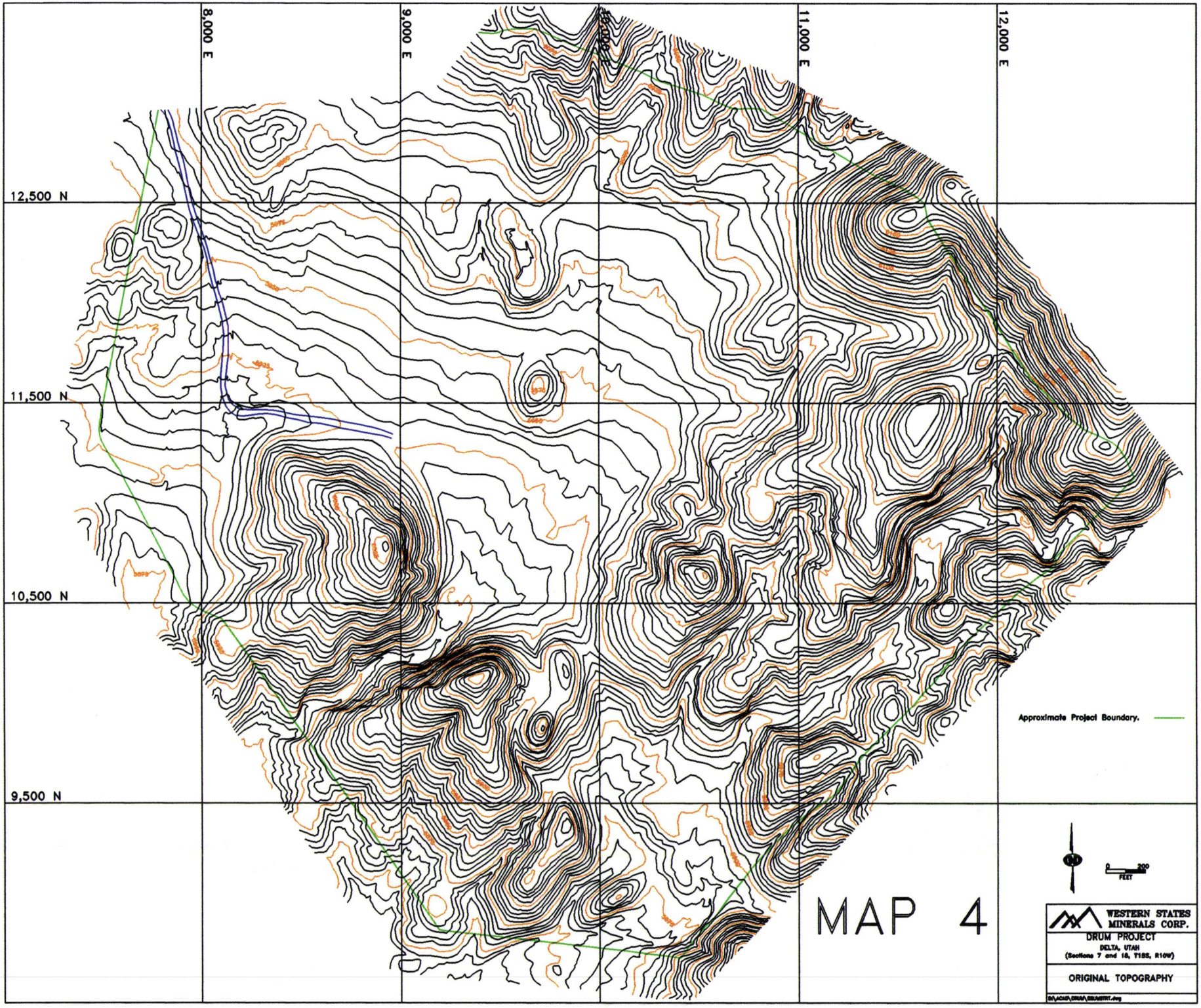
Map 1	**Approximate Final Topography**
Map 2	**Current Topography**
Map 3	**Topsoil/Growth Media Areas**
Map 4	**Original Topography**
Map 5	**Material Destination Map**

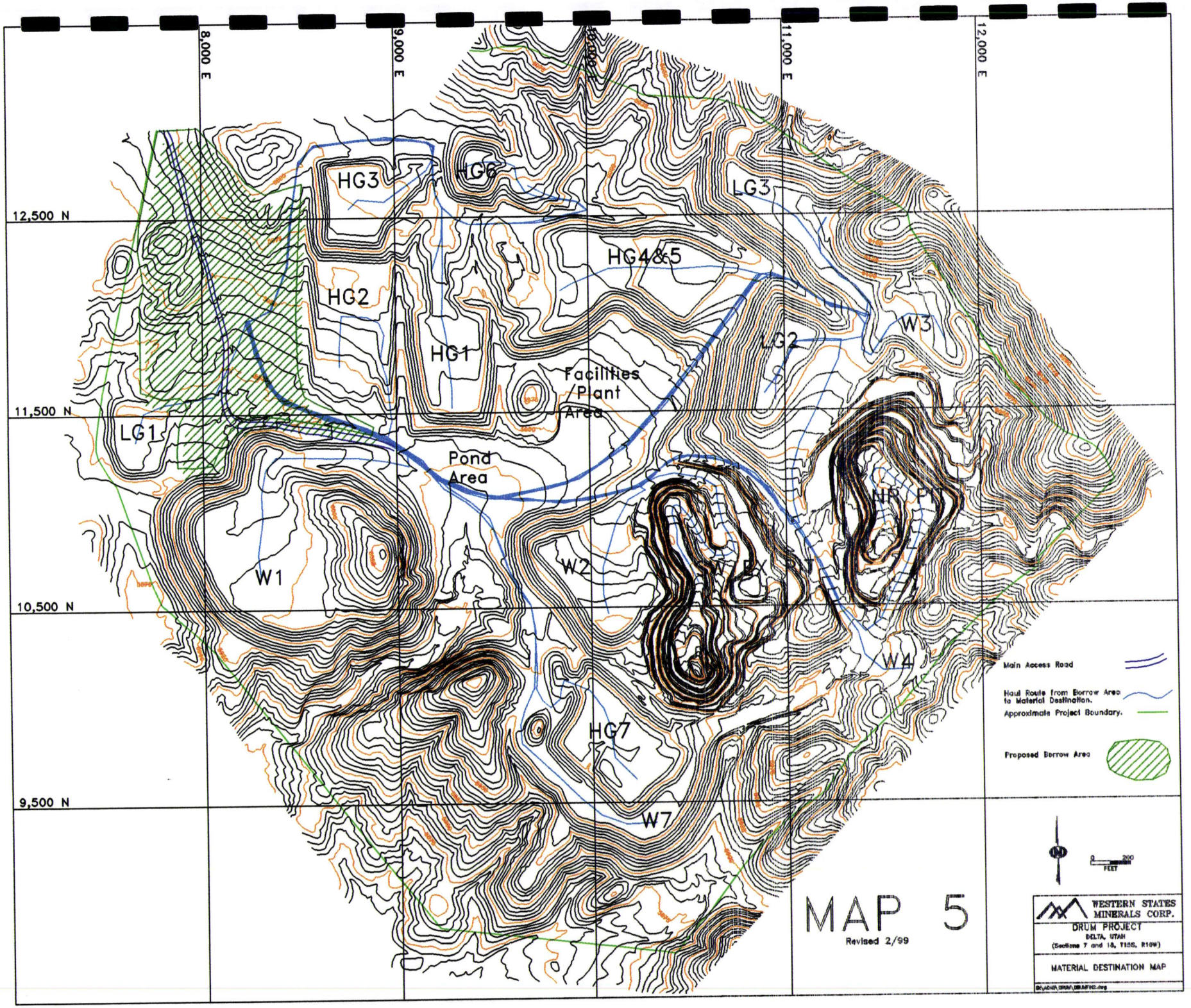

8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
LG3
HG4&5
HG2
HG1
LG2
W3
Facilities
Plant
Area
LG1
Pond
Area
NR Pit
W1
W2
PX Pit
W4
HG7
W7
Main Access Road
Proposed Drainage Channels.
Rip-rapped where appropriate.
Approximate Project Boundary.
Pit Perimeter Berm
Proposed Borrow Area
0
200
FEET
MAP 1
Revised 2/99
WESTERN STATES
MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T18S, R10W)
APPROXIMATE FINAL TOPOGRAPHY


8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
LG3
HG4&5
HG2
HG1
LG2
W3
LG1
New Landfill Area Location
W1
Existing Landfill Area ?
W2
W4
HG7
W7
Approximate Project Boundary.
Approximate outer dimension of pad liner.
Components assessed as WSMC's responsibility for characterization.
0
200
FEET
MAP 2
Revised 3/98
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T15S, R10W)
CURRENT TOPOGRAPHY



Location	Area (sqft)		Topsoil Depth (ft)	Volume (cuft)
1	420175		4	1,680,700
1a	14,723		5	73,615
2	304,225		3	912,675
3	104,063		4	416,252
4	164,135		6	984,810
5	356,895		2	713,790
6	201,004		3	603,012
7	33,519		4	134,072
8	44,918		4	179,672
9	257,218		2	514,436
9a	10,148		4	40,592
10	130,680	approx.	4	522,720
11	871,200	approx.	6	5,227,200


8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
Approximate Project Boundary.
MAP 4
0
200
FEET
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T18S, R10W)
ORIGINAL TOPOGRAPHY


8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
LG3
HG4&5
HG2
HG1
LG2
W3
Facilities
/Plant
Area
LG1
Pond
Area
NR Pit
W1
W2
W4
HG7
W7
Main Access Road
Haul Route from Borrow Area to Material Destination.
Approximate Project Boundary.
Proposed Borrow Area
0
200
FEET
MAP 5
Revised 2/99
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T12S, R10W)
MATERIAL DESTINATION MAP

APPENDIX A

Characterization Sampling Plan

CHARACTERIZATION SAMPLING PROGRAM

FOR

HEAP LEACH PADS AND WASTE ROCK DUMPS

Located at the

DRUM MINE
MILLARD COUNTY, UTAH

November 1997

Prepared for
Western States Minerals Corporation

Prepared by
E.M. (Buzz) Gerick - V.P. Operations
James Ashton , P.E. - Project Engineer

SCOPE OF WORK:

This program proposes sampling and testing methodologies for representatively characterizing spent heap leach ore and waste rock at the Drum Mine located in sections 7 and 18, T15S, R10W and approximately 35 miles northwest of Delta, Utah in Millard County. To date, there is no regulatory or statistically accepted rule-of-thumb for what is considered ***representative*** sampling of mine waste components. Attempts have been made to formulate sampling criteria, but many site specific factors complicate such formulation including: 1) Lithologic, geochemical and climatic variability; 2) Required test method(s) and intent; 3) Waste component volume, tonnage and physical characteristics.

Once a representative sampling methodology is accepted and samples collected, the characterization results will be evaluated/interpreted and utilized to prepare a final permanent closure plan pertinent to those specific components located at the Drum Mine. Within this program is described the proposed methodology for sampling four (4) inactive spent heap leach pads, one (1) heap leach pad (e.g., LG1) which was never leached and two (2) inactive waste rock dumps; plus an inactive waste dump (designated W7) that one of the inactive spent heap leach pads (designated HG7) is built upon. The proposed laboratory testing of the collected samples relevant to their current status regarding stabilization is also outlined. Map 1 shows the locations of the five heaps and three waste dumps that Western States Minerals Corporation (WSMC) proposes to sample and characterize. Also shown on Map 1 are the proposed sample locations for each component.

The intent of this program is to collect representative samples from which the analytical results will provide characterization and analytical information necessary for the preparation of the following:

(1) Formal closure and final reclamation of these waste components;
(2) Current status of component stabilization;
(3) What additional or alternative stabilization efforts may be considered, if any; and
(4) Future monitoring needs that may be required to demonstrate that ground and surface water(s) will not be degraded.

INTRODUCTION:

The Drum Mine, a conventional open pit and heap leach facility, ceased mining operations in 1985 while leaching continued for some time thereafter. Mine waste components generated at the site during mining activity include three low-grade (LG1 through LG3) and seven high-grade (HG1 through HG7) heap leach pads and four waste rock dumps (W1 - W4), in addition to two open pits and ancillary facilities (e.g., offices, maintenance and process facilities and process ponds). Of the waste components, WSMC has agreed to evaluate and characterize spent ore on four (4) heap leach pads (LG2, LG3, HG6, HG7), three (3) waste rock dumps (W2, W3, and the dump designated W7, located underneath HG7) and a low grade ore stockpile on the heap leach pad LG1, in preparation for final closure and reclamation. Based on visual inspection of the waste components, pit walls and mining records, WSMC believes it is reasonable to assume lithologic and geochemical homogeneity within a given heap or waste rock dump.

It is not clear whether heap rinsing/detox activity(s) occurred following cessation of active leaching. However, it is known that the Department of Water Quality ordered cessation of active leaching in 1990. During the discovery inspection that WSMC representatives made of the site on Sept. 16, 1997; no solution was observed on any of the heaps or liner systems that are designated as WSMC's responsibility. In fact, most of the drainage pipes were disconnected. We suspect that heap drain-down solution is uncommon and typically flows in response to major storm events only. Consequently, heap solution(s) are not likely to be available for collection and analysis. Normally, if heap drain-down solution was available, a sample could be taken and an analysis performed. Then, results of the analysis could be interpreted and a prediction made of what constituents and/or contaminants (i.e., Profile II), if any, might be mobilized from

the spent ore. Since no solution is currently flowing from the heaps, an alternative approach to characterize these facilities is herein proposed.

PROPOSED HEAP ORE SAMPLING:

General: Each heap will be divided up into sections (number of sections depends on heap surface area). Within each section, three (3) sample locations will be marked. The three locations will be determined in a manner as to generate a representative sample for that section. Sample collection will be performed to minimize the introduction of air and/or water which could potentially degrade residual cyanide concentrations, if present. Sampling of the spent ore will be done using an excavator with a maximum reach of 25 feet. WSMC believes this is sufficient to characterize the material which will be pushed off the liner during the subsequent reduction of the slopes to reclamation grades. A cross sectional comparison between the current heap configuration and the proposed final heap configuration (e.g., Figure 1 showing sections A-A' through D-D') show that the deepest cut into the heaps during contouring is 22 feet. Map 2 is an engineered estimate of the final site topography, for those components assessed to WSMC, after reclamation contouring. Figures 1 consists of four (4) cross sections through the heaps showing the original, current and final topographies. Samples (approximately 25 lbs / 5-gal bucket) will be collected in 5 ft. increments from the excavator bucket using a hand shovel. All samples will be carefully sealed, labeled and temporarily stored in a cool, dry location. The samples will then be transported to a selected Nevada certified laboratory for analysis along with appropriate chain of custody form(s).

Individual samples will be opened by laboratory personnel and thoroughly blended by hand; the samples should not be dried beyond their existing moisture content thereby minimizing any cyanide degradation. Individual samples will be cut and quartered. The quartered samples from each five foot interval will be combined to form four (4) representative composite samples for each trench. These composited trench samples will then be composited with the other trenches from the section to form four representative composite samples for each section. For instance: 1) the heap LG3 will be divided into three sections; 2) using a track mounted excavator to collect samples, three test pits will be excavated in each section and samples will be collected on five (5) foot intervals to a depth of twenty-five (25) feet; 3) The samples will be collected using a hand shovel and placed in a five gallon bucket. The bucket will be sealed, labeled and appropriately stored and then transported to a qualified laboratory; 4) Laboratory personnel will blend and quarter each five (5) foot sample. These quartered samples will then be combined with the other five (5) foot samples from a particular trench to create three (3) discrete composite samples per trench. The fourth individual five foot sample will be saved for possible use in the future. Two of the three (3) composited trench samples will be combined with the other trench samples from that particular section to form two (2) representative samples for each section for analysis by distinct test methods as described hereafter. Map 1 shows the proposed sample locations and heap division lines. Low grade heap number 1 (LG1) will be considered as a waste rock dump, for purposes of sampling and analysis, since no leaching occurred on this component.

PROPOSED WASTE ROCK SAMPLING:

W1, W2, W3, W7 and LG1: Waste rock dumps will also be sampled using an excavator. Based on observations in the field and examination of the pit wall rock, it will be assumed that the waste rock dumps are lithologically and geochemically homogeneous throughout. If during the sampling process this assumption is determined to be invalid then the sampling procedure will be adjusted to take this variability into account. Each excavated test pit will be sampled every five foot in depth. The samples from the entire column will be placed into a single five gallon bucket (approximately 25 pounds). This sample will be considered representative for that particular test pit. Samples will be carefully sealed and labeled, and transported to the selected laboratory. There, laboratory personnel will blend, cut and quarter the samples from each waste rock dump. The resulting composite samples for each waste rock dump will be analyzed by the distinct test method as described below. Map 1 shows the proposed sample locations for the waste rock dumps. High grade heap number seven (HG7) was built on a waste rock dump. This waste rock

dump has been designated as W7 for sampling purposes. WSMC assumes that this waste component will be closed and reclaimed along with HG7.

TESTING METHODS:

General: Spent heap leach ore samples should be analyzed for WAD cyanide and paste pH, Profile II constituents (MWMP - Nevada protocol and SPLP EPA Method 1312) and for their acid generating capability(s) (AGP - ANP). Studies have shown, if material(s) pass the MWMP they are expected to pass the SPLP test.

MWMP: Meteoric Water Mobility Procedure is a test method to determine the capability of specific constituents (NDEP Profile II) to be mobilized from spent ore by "meteoric events". This is a laboratory procedure and not a field simulation so the results cannot be expressly extrapolated to be representative of the internal geochemical dynamics of a given heap. However, it gives a reasonable correlation of what can be expected to occur in the field.

SPLP: The Synthetic Precipitation Leaching Procedure is an Environmental Protection Agency (EPA) test method to determine the mobility of both organic and inorganic analytes present in samples of soils, wastes and wastewaters by "meteoric events".

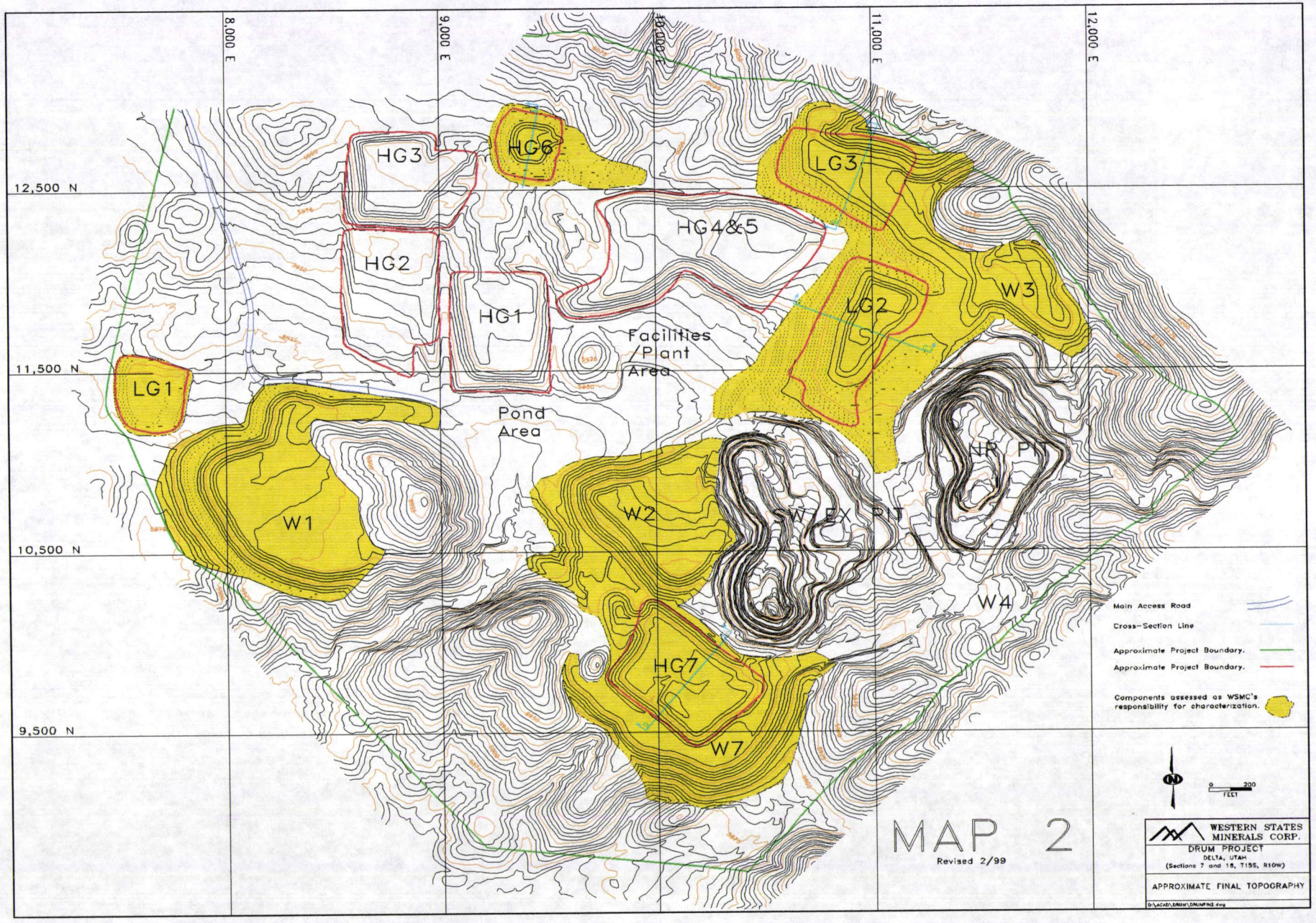
AGP - ANP: (Acid Generating Potential - Acid Neutralization Potential) This test method incorporates the acid-base accounting of mineral sulfur and carbonate content relevant to acidification / neutralization capability of waste rock.

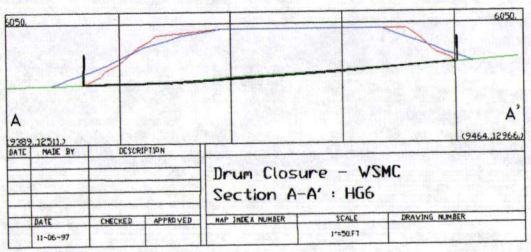
Permeability / Moisture Content of Spent Heap Ore: Samples will be evaluated relevant to the insitu moisture content and permeability of spent ore. This information is needed to determine the type, if any, of engineered infiltration cover which might be necessary for upper heap surfaces. If the spent ore has the potential to mobilize contaminants, they will have to be contained. Preliminary test results indicate that this is not expected to be a problem. The residual moisture held within the heaps will need to be quantified in order to determine the potential flow from the heaps due to predicted meteoric events.

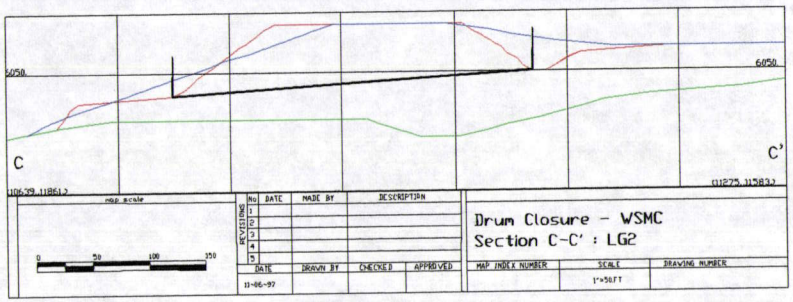
PROPOSED NATIVE SOIL SAMPLING:

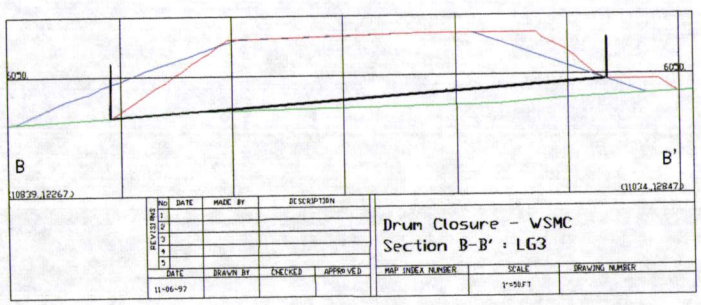
Samples will be collected adjacent to and outside the lined heaps to perform analyses of the natural native soils near the heaps. However, the actual sample locations will be determined in the field, at the time of collection and documented on an "As-built" map. Samples will be composited into one sample for each heap and analyzed using the SPLP test. In addition, the general physical characteristics (i.e., soil type, clay content, porosity and permeability) for each composite will be recorded. The excavator will be used to help collect these native soil samples. The attenuation properties of the Drum native soils may be desired in the future to finalize closure plans. These soil samples will be saved for such testing if needed.

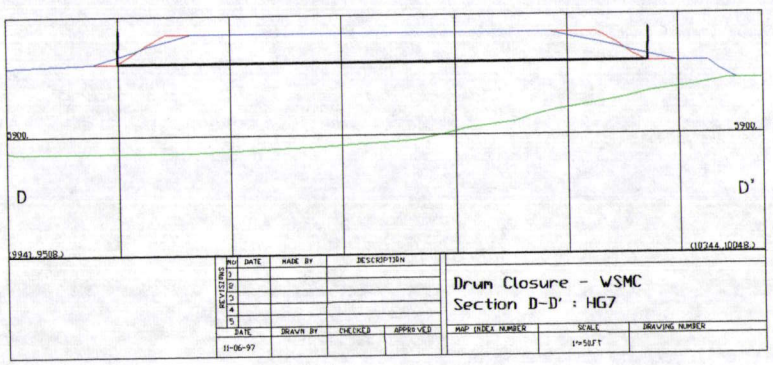

8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
HG4&5
HG2
HG1
LG3
LG2
W3
LG1
New Landfill Area Location
W1
Existing Landfill Area ?
W2
SW PX PIT
NR PIT
W4
HG7
W7
Cross-Section Line
DOGM Sample Location
WSMC Sample Location
Heap Sectional Line
Approximate Project Boundary.
Approximate outer dimension of pad liner.
Components assessed as WSMC's responsibility for characterization.
N
0
200
FEET
MAP 1
Revised 3/98
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T15S, R10W)
CURRENT TOPOGRAPHY
D:\ACAD\DRUM\DRMMAP.dwg


8,000 E
9,000 E
10,000 E
11,000 E
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
HG4&5
HG2
HG1
LG3
LG2
W3
LG1
Facilities
/Plant
Area
Pond
Area
W1
W2
NR PIT
W EX PIT
W4
HG7
W7
Main Access Road
Cross-Section Line
Approximate Project Boundary.
Approximate Project Boundary.
Components assessed as WSMC's responsibility for characterization.
N
0
200
FEET
MAP 2
Revised 2/99
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T15S, R10W)
APPROXIMATE FINAL TOPOGRAPHY









Approximate liner location
Final Topography (Slope - 3H : 1V)
Current Topography
Original Topography

WESTERN STATES MINERALS CORP.

Drum Mine Closure - WSMC

DELTA, UTAH

CROSS SECTIONS OF HEAPS

D:\ACAD\DRUM\SECTIONS.dwg

Figure 1

WESTERN STATES MINERALS CORPORATION

February 3, 1998

Mr. Ron Teseneer
U.S. Dept. of the Interior
BLM- House Range/Warm Springs Resource Area
35 East 500 North
Fillmore, UT. 84631

and

Mr. Wayne Hedberg
State of Utah-Dept. of Natural Res.
DOGM-Minerals Program
P.O. Box 145801
Salt Lake City, UT. 84114-5801

RE: Letter of Response to the meeting held between representatives of the BLM, DOGM, and WSMC on January 13, 1998

Dear Ron and Wayne:

This letter is written in response to the meeting that we both attended on January 13, 1998 at the DOGM's Office Complex in Salt Lake City. The meeting included representatives from the BLM's State Office in Salt Lake City, UT. and House Range/Warm Springs Resource Area Office in Fillmore, UT.; DOGM's technical staff in Salt Lake City, UT.; and Western States Minerals Corp. The meeting lead to the clarification of several issues; the most prominent being the resolution of the proposed Characterization Sampling Program for Heap Leach Pads and Waste Rock Dumps located at the Drum Mine, dated Nov. 1997. In addition, I understand your need for a brief Synopsis of the Proposed Reclamation Plan for the site to include in the Environmental Assessment (EA), that your agency will be writing. Of course, the results of the heap and waste dump sampling and analysis program will provide the data necessary to develop the final Reclamation Plan for the Drum Mine; but the Synopsis will give you a good approximation of the general reclamation that will be proposed. The last request made was for a proposed schedule of site activities, beginning with sampling and proceeding through completion of reclamation at the Drum Mine area. Therefore, in an effort to keep the response to each issue clear and concise, I'll develop a separate write-up for each and attach them to this cover letter.

I do have a question that requires clarification, and would appreciate your prompt response. In a letter from E.B. King (Jumbo) to W. Hedberg (DOGM) dated Feb. 1995, Jumbo discusses the identification of available growth media found within the project boundary. However, the quality of those areas do not apear to have been tested. Therefore, first, WSMC requests confirmation from the BLM and/or DOGM that those quantities of growth media referred to in Jumbo's February 1995 letter, are valid; and, second, if those quantities are valid, does the agronomic quality of this growth media need to be analyzed?

If you have any questions or comments concerning the attached information, please call me or Jim Ashton at your convenience at the number listed below.

Sincerely,

E.M. (Buzz) Gerick
Vice President of Operations

cc: Al Cerny- WSMC, Wheat Ridge
Jim Ashton- WSMC, Reno
DRUM file

250 S. Rock Blvd., Suite 130 ▲ Reno, NV 89502 ▲ (702) 856-3339 ▲ FAX (702) 856-1818

ADDENDUM TO THE CHARACTERIZATION SAMPLING PROGRAM FOR HEAP LEACH PADS AND WASTE ROCK DUMPS LOCATED AT THE DRUM MINE, dated November 1997

In addition to the original proposals stated in the *Characterization Sampling Program for Heap Leach Pads and Waste Rock Dumps located at the Drum Mine - dated November 1997*; this Addendum includes a proposal to sample and analyze several other areas: 1) areas where growth media might be recovered, within and outside the project boundary; and 2) Waste Dump # 1.

Growth Media sampling plan The areas identified, were presented to WSMC by BLM representatives, as possible areas where growth media might be salvaged for later use during reclamation activities. The areas to be sampled are identified on the attached map - Addendum Figure 1.

The following sampling and analysis criteria will be followed for the proposed growth media testing areas:

- At least one test pit per 2.5 acres will be excavated to evaluate and sample the growth media areas. The test pits will be excavated using an excavator or backhoe. Cross country travel will be used to access the test pit sites. Once sampling of the test pits is completed, they will be back-filled and reclaimed.

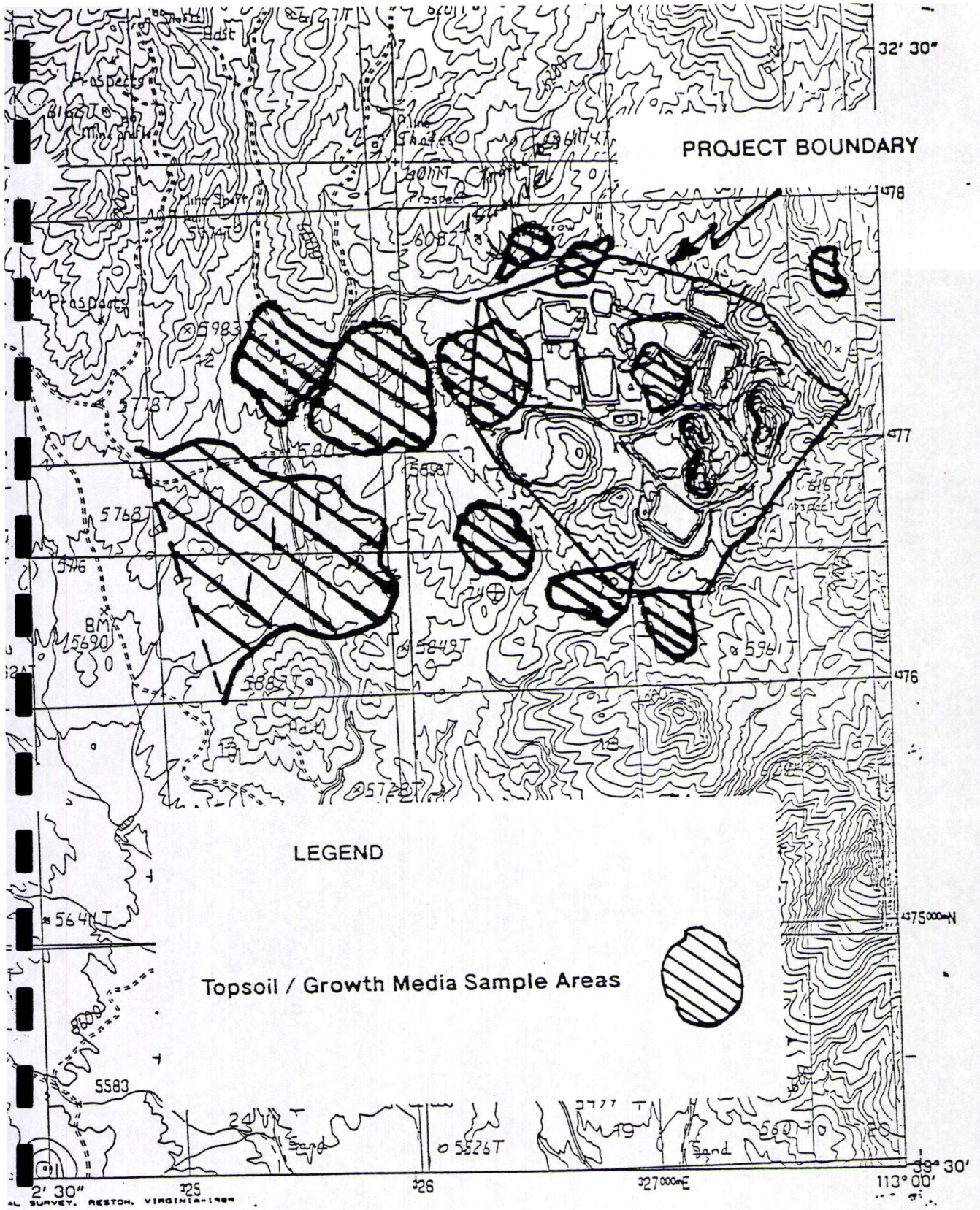
- At least one composite sample will be developed for each five to ten acre parcel (e.g. this assumes one set of samples for each soil horizon within this parcel). The various soil horizons in each excavation will be sampled individually. Sample compositing will be done, to the extent possible, in a manner that will prevent mixing of the various soil horizons. This is a generalized criteria that may be modified in the field, depending upon what we encounter. In addition, for each excavation, the depth or thickness of each soil horizon will be recorded so that a total amount of soil can be quantified from the recordations.

- The analysis criteria for the composite samples will generally involve the following constituents called for in the DOGM Minerals Program:

1. Texture
2. pH
3. EC (conductivity)
4. Saturation percentage
5. SAR
6. Percent organic matter
7. CEC (cation exchange capacity)
8. Alkalinity
9. $CaCO_3$
10. Sulfur (acid potential)
11. Selenium
12. Total nitrogen
13. Nitrate nitrogen
14. Phosphorus (as P_2O_5)
15. Potassium (as K_2O)

The data generated from this testwork should provide the quantity and quality of growth media available for reclamation purposes at or near the Drum minesite. This will then be incorporated into the proposed Reclamation Plan for the site.

Waste Dump # 1 sampling plan- Assuming WSMC's proposal regarding reclamation of Waste Dump # 1 is accepted as written (see *Settlement and Reclamation Agreement* submitted Feb. 3, 1998), Waste Dump # 1 will be sampled and analyzed using the same criteria as presented in the original text entitled *Characterization Sampling Program for Heap Leach Pads and Waste Rock Dumps located at the Drum Mine - dated November 1997*. The sample locations are identified on the attached map - Addendum Figure 2.



UTAH

QUADRANGLE LOCATION

1	2	3	1 Topaz Mountain West 2 Topaz Mountain East 3 Picture Rock Hills 4 Topaz Mountain SW 5 Drum Mts. Well 6 Whirlwind Valley NW 7 Little Drum Pass 8 Smelter Knolls West
4		5	
6	7	8	

ADJOINING 7.5' QUADRANGLE NAMES

ROAD LEGEND

Improved Road . . . . . ——————

Unimproved Road . . . . . - - - - - - - -

Trail . . . . . --------

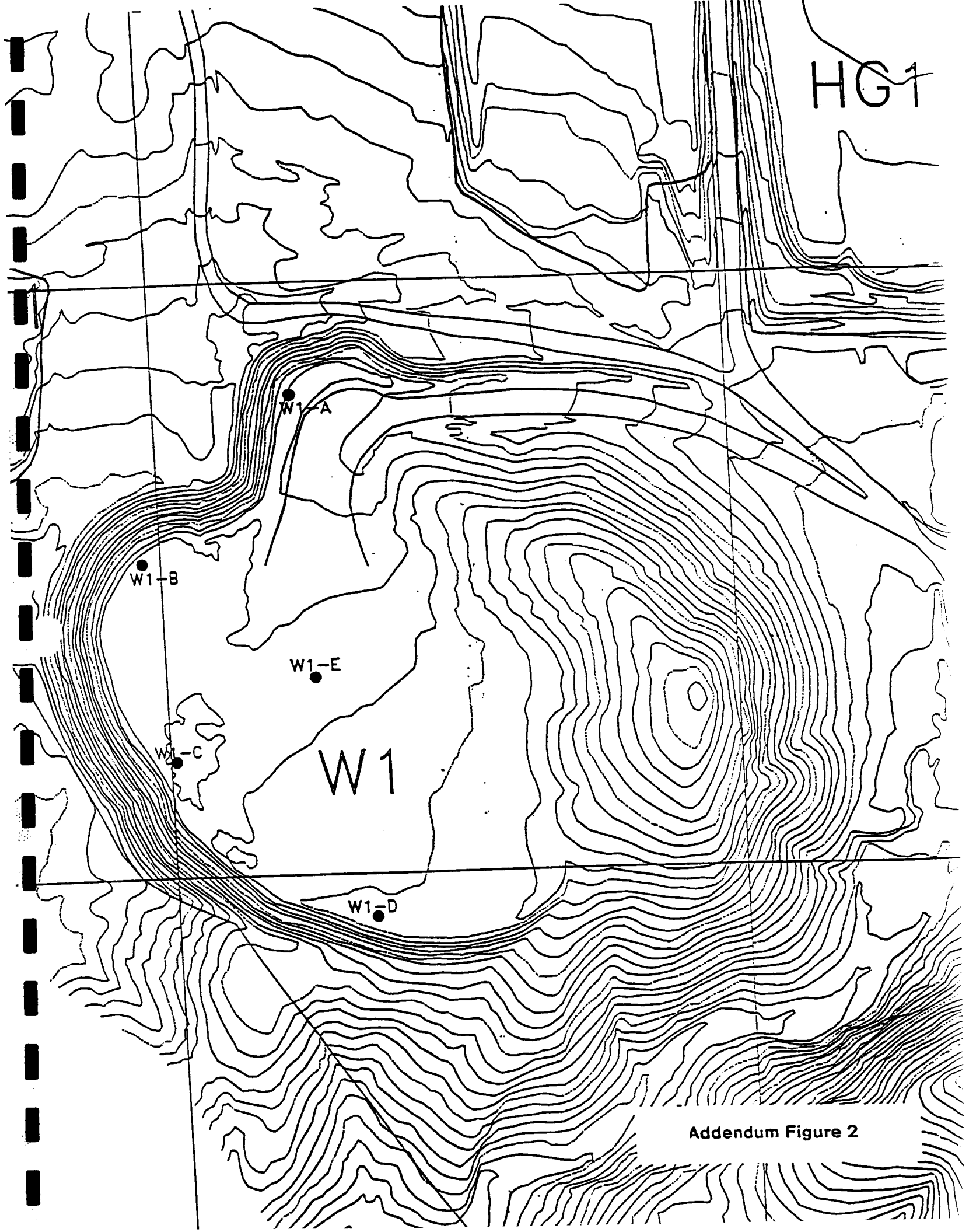
Interstate Route U.S. Route State Route

Addendum Figure 1

LADY LAIRD PEAK, UTAH

PROVISIONAL EDITION 1988

39113-E1-TF-024



Addendum Figure 2

SYNOPSIS OF PROPOSED RECLAMATION PLAN
for the
DRUM MINE

The following generalized parameters will be incorporated into a revised Reclamation Plan for the Drum Mine; and then refined, when the data gathered during the sampling and characterization program is completed and incorporated into the final product. This assumes (e.g. based on a preliminary composite sample of the waste rock dumps and the spent ore from the heaps) that the material located on the waste dumps and the heap leach pads is benign and can be moved off the existing containment, without causing any adverse impact to the local or regional ecosystem. This hypothetical plan envisions the whole site being reclaimed to a similar standard; however, it only specifically, addresses that reclamation work that Western States Minerals Corporation (WSMC) is responsible for.

Goals of the Reclamation Plan

- Ensure public safety, and reduce or eliminate adverse impacts

- Minimize off-site impacts by controlling infiltration, erosion, sedimentation and related degradation of drainages that pass through the site

- Return the disturbed areas to a stabilized condition similar to that which existed prior to mining activities

- Re-establish a stable environment that will support a diverse self-sustaining vegetation and wildlife habitat, consistent with accepted land use objectives

- Achieve a visual compatibility with the surrounding landscape

Reclamation Plan parameters

- Regrade heaps and waste dumps to an approximate 3H to 1V slope; and shaped to reduce the potential for standing water

- Application of 6 to 12 inches of growth medium (e.g. soil and substitute topsoil) to the regraded surfaces. This depends upon successfully locating an adequate amount of growth medium to complete the task, within and slightly outside the project boundary. The application amount is not only dependent upon the availability, but also on the area where it will be applied (e.g. aspect, availability of existing fines, toxicity characteristics, if any, and ability to support a self-sustaining vegetative growth). All growth medium will be evaluated for its ability to sustain vegetation, and will be adjusted with fertilizer or other additives, accordingly.

- Surface drainages will be reestablished throughout the property; to prevent excessive ponding or erosion by meteoric waters, falling on or flowing through the property

- Haul and access roads, associated with each heap or waste dump, will be ripped, regraded, and growth medium applied

- Wherever growth medium is applied, the surface will be roughened to prevent erosion, as a seedbed preparation, and to harvest meteoric water to enhance plant growth

- Finally, an appropriate seed mixture will be applied to all reclaimed surfaces

A PROPOSED SCHEDULE OF ACTIVITIES LEADING TO COMPLETION OF RECLAMATION AT THE DRUM MINE

The following is preliminary schedule of activities leading to completion of reclamation at the Drum mine. This schedule assumes that on-site work would commence during April 1998, and progress through final reclamation. ***Note: This schedule only covers that work associated with Western States Minerals Corp. responsibility.***

Activity	Date
- Receipt of Regulatory agency approval of the *Characterization Sampling Program for the Heap Leach Pads and Waste Rock Dumps located at the Drum Mine*	April 1, 1998
- Field sampling of Drum mine	April 14 - May 1, 1998
- Sample analysis (assumes 6 wk. to 2 mos.)	May 4 - June 26, 1998
- Submittal of *Reclamation Plan for the Drum Mine* to Regulatory agencies for approval	July 14, 1998
- Receipt of Regulatory approval for the *Reclamation Plan for the Drum Mine* (assumes 30 to 60 days turn around)	Aug. 14 to Sept. 14, 1998
- Initiate reclamation at Drum mine	Sept. 29, 1998
- Complete reclamation at Drum mine (assumes approx. 6 mos. to complete)	April 15, 1999
- Post closure monitoring period (assumes approx. 2 year monitor period prior to release)	April 15, 1999 through April 15, 2001

APPENDIX B

Characterization Sampling Laboratory Results
And
Summary Tables

LABORATORY RESULTS:

MWMP Profile II Results – All Heaps
WAD Cyanide (mg/kg) and Moisture Percent – All Heaps and Pond Solids
ANP/AGP Results – All Heaps and Waste Dumps
NDEP Profile II Results – Pregnant and Barren Pond Solution
NDEP Profile II Results – Heap Perimeter Soil Samples (4)
Hydraulic Conductivity Testing Results – All Heaps
Soil Test Results – All Nine (9) Tests

TABLE B-1
WESTERN STATES MINERALS CORPORATION
SPENT ORE HEAPS CHARACTERIZATION RESULTS

	PARAMETER	Limit mg/l	LG1 mg/l	LG2-1 mg/l	LG2-2 mg/l	LG2-3 mg/l	LG3-1 mg/l	LG3-2 mg/l	LG3-3 mg/l	HG1-1 mg/l	HG1-2 mg/l	HG2-1 mg/l	HG2-2 mg/l	HG3-1 mg/l	HG3-2 mg/l	HG4&5-1 mg/l	HG4&5-2 mg/l	HG4&5-3 mg/l	HG6-1 mg/l	HG6-2 mg/l	HG7-1 mg/l	HG7-2 mg/l	HG7-3 mg/l	HG7-4 mg/l
Meteoric Water Mobility Procedure - Solution Analysis	pH	6.5-8.5	7.91	8.36	8.73	7.64	8.27	7.44	7.77	9.03	8.77	8.65	8.95	7.66	7.51	8.21	8.58	8.21	7.06	7.58	8.69	7.8	8.92	8.36
	Alkalinity, CaCO3		46	44	41	52	34	36	58	93	64	47	74	100	66	92	90	96	48	45	66	50	65	44
	Bicarbonate		56	51	46	63	41	40	71	94	68	48	76	122	80	112	110	117	59	55	71	61	62	51
	Aluminum		0.16	1.2	1.8	0.22	0.3	0.36	0.86	1.4	0.12	0.06	0.04	1.2	0.78	1.1	0.4	1.8	3.2	0.82	2.3	0.52	2.9	0.16
	Antimony		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Arsenic	0.05	0.005	0.024	0.045	<0.005	0.025	<0.005	0.023	0.094	0.028	0.014	0.021	0.096	0.083	0.081	0.016	0.013	0.028	0.039	0.056	0.022	0.19	0.055
	Barium	2	0.11	0.2	0.18	0.08	0.26	0.12	0.14	0.18	0.18	0.16	0.16	0.15	0.19	0.17	0.16	0.18	0.23	0.21	0.28	0.13	0.24	0.19
	Beryllium		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Boron		0.17	0.12	0.14	0.07	0.15	0.08	0.18	0.21	0.15	0.1	0.21	0.2	0.17	0.16	0.19	0.17	0.15	0.12	0.33	0.09	0.19	0.09
	Cadmium	0.005	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
	Calcium		38	3.5	3.1	83	5	40	3.8	1.7	2.3	2.3	1.6	5.1	2.9	6.7	2.3	5.3	5.5	4.5	7.4	4.3	6.7	3.3
	Chloride	250	60	70	45	140	29	99	38	43	57	44	73	10	16	22	57	1.4	1.3	1.2	77	35	46	95
	Chromium	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Copper	1.3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	0.04	0.03	<0.01	0.06	0.02	0.02	0.01	<0.01	0.01	<0.01
	Fluoride	2	0.85	0.47	0.53	0.2	0.31	0.35	0.58	0.82	0.96	0.38	0.62	0.57	0.28	0.33	0.58	0.35	0.32	0.27	0.82	0.4	0.66	0.58
	Iron	0.3	<0.05	0.31	0.76	<0.05	0.11	<0.05	0.12	0.94	0.06	<0.05	<0.05	0.56	0.39	0.72	0.2	0.99	2.1	0.53	1.1	0.07	0.86	0.11
	Lead	0.015	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002	0.003	0.004	0.006	<0.002	0.006	0.019	0.005	0.018	<0.002	0.011	<0.002
	Magnesium	125	7.9	0.6	<0.5	15	0.8	6.2	0.6	0.8	0.5	<0.5	<0.5	0.8	0.7	1.4	<0.5	1.5	2.2	1.1	1.9	0.8	1.7	0.7
	Manganese	0.05	0.02	<0.01	0.01	0.48	<0.01	0.02	<0.01	0.07	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01	0.03	0.04	0.01	0.02	<0.01	0.03	<0.01
	Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Nickel		<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Nitrate Nitrogen	10	<1	3.6	1.8	4.1	<1	3.1	1.2	1.1	2.2	1.7	1.7	<1.0	<1.0	<1.0	1.1	<1.0	<1	<1	4.6	1.7	1.3	5.1
	Nitrite Nitrogen		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Potassium		2.4	2.1	1.6	3.5	1.7	2	1.9	2.7	2	1.7	1.9	1.9	2	2.2	2	2.3	1.6	1	3.5	1.3	2.2	2
	Selenium	0.05	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
	Silver	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Sodium		63	87	56	160	43	140	73	64	91	68	100	65	48	41	92	37	18	17	110	60	70	110
	Sulfate	250	190	55	40	400	45	240	93	29	53	30	44	18	13	16	31	7	8	7	42	87	32	80
	Thallium		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	0.001
	TDS	500-1000	630	320	310	840	210	730	300	290	280	130	200	190	110	180	500	200	67	60	350	260	290	370
	Cyanide, WAD	0.2	<0.01	0.018	0.013	0.011	0.014	0.021	<0.01	0.01	0.021	0.026	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005	<0.005	0.051	0.03	0.031	0.044
	Zinc	5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.06	<0.05	0.08	<0.05	0.06	<0.05
	Bismuth		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Cobalt		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Gallium		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Lithium		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Molybdenum		<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
	Phosphorus		0.9	0.86	<0.5	0.92	<0.5	0.98	<0.5	<0.5	0.73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.96	<0.5	0.73
	Scandium		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Strontium		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Tin		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Titanium		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Vanadium		<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Solid Analysis	HEAP SOLIDS TESTING:																							
	Moisture, %		2.1	3.5	5.3	6	5.4	6.1	4.2	7	7.4	7	7.5	5.8	5.2	5.7	5.8	5.5	3.2	3.3	6.4	3.1	1.4	3.8
	Cyanide, WAD mg/kg		<0.05	0.3	<0.05	<0.05	<0.05	<0.05	2.6	0.41	0.73	0.49	0.43	<0.05	0.34	0.34	0.32	<0.05	<0.05	<0.05	0.52	0.3	<0.05	0.3
Solid Analysis	AGP/ANP TESTING:																							
	Neutralization Potential		90	10	49	1	50	59	57	103	277	178	99	23	12	7	50	29	3	7	38	52	48	16
	Acid Gen. Potential		13	25	12	32	26	11	4.1	2.2	5.6	13	6.3	8.1	9.1	4.7	7.2	13	1.3	5	16	14	6.9	28
	Ratio NP/AP	<3	6.9	0.4	4.1	0.0	1.9	5.4	13.9	46.8	49.5	13.7	15.7	2.8	1.3	1.5	6.9	2.2	2.3	1.4	2.4	3.7	7.0	0.6
	Acid Gen. Sulf. Poten.			5		8.4	10							1.3	1.6	0.3		0.3	0.3	0.3	0.3			3.4
	Ratio NP/APS	<3		2.0		0.1	5.0							17.7	7.5	23.3		96.7	10.0	23.3	126.7			4.7
Material Properties	Hydraulic Conductivity Testing:																							
	Initial Moisture, %		2.7	1.5	2.7	5.8	5.7	7	4.9	8.3	7.3	6	6.7	6.3	3.3	5.1	5.1	4.4	2.6	3.1	4.5	4.2	1.8	4.4
	Final Moisture, %		12.8	11.4	13	16.1	12.3	14.4	12.1	14.2	14.1	15.4	13.8	9.6	8.1	10.4	7.7	7.6	11.9	14.4	7.1	12.7	11.2	13.6
	Start Dry Density, pcf		86.5	86	87.4	78.2	78.8	79.7	82.8	77.7	78	75.9	73	78	84.1	82	82.2	81.3	85.6	87.6	89.8	89.9	90	85
	Final Dry Density, pcf		106.3	104	109.3	87.2	86.9	104.5	104.5	113	108.3	110.8	111.4	96.3	96.9	103.3	97.8	98.8	98	113.9	102.8	111.9	109.5	107.2
	Final Porosity		0.301	0.32	0.234	0.419	0.41	0.31	0.31	0.258	0.305	0.29	0.278	0.368	0.374	0.335	0.353	0.361	0.365	0.266	0.332	0.226	0.309	0.28
	Hydraulic Cond., cm/sec		$1.5x10^{-1}$	$1.5x10^{-1}$	$2.2x10^{-2}$	$5.1x10^{-2}$	$1.7x10^{-1}$	$1.1x10^{-2}$	$1.3x10^{-1}$	$1.1x10^{-2}$	$1.5x10^{-2}$	$7.1x10^{-5}$	$7.4x10^{-5}$	$1.8x10^{-2}$	$9.5x10^{-2}$	$5.5x10^{-2}$	$1.1x10^{-1}$	$1.6x10^{-1}$	$9.0x10^{-2}$	$8.0x10^{-2}$	$7.8x10^{-2}$	$6.3x10^{-2}$	$1.6x10^{-1}$	$2.0x10^{-2}$
	Specific Retention		0.218	0.19	0.228	0.225	0.171	0.241	0.203	0.257	0.245	0.273	0.246	0.148	0.126	0.121	0.172	0.12	0.187	0.262	0.117	0.227	0.197	0.234

Note: Shading indicates an exceedance

TABLE B-2
WESTERN STATES MINERALS CORPORATION
WASTE DUMP CHARACTERIZATION RESULTS

	PARAMETER	Limit	W1	W2	W3	W7
Solid Analysis	AGP/ANP TESTING:					
	Neutralization Potential		332	706	64	144
	Acid Gen. Potential		15	2.5	11	60
	Ratio NP/AP	<3	22.1	282.4	5.8	2.4
	Acid Gen. Sulf. Poten.					29
	Ratio NP/APS	<3				5.0

Note: Shading indicates an exceedance

TABLE B-3
WESTERN STATES MINERALS CORPORATION
PROCESS FACILITIES CHARACTERIZATION RESULTS

	PARAMETER	Limit mg/l	PREG Solids	BARREN Solids	PREG Water	BARREN Water
Process Solution Ponds Characterization Results	pH	6.5-8.5	8.29	12.09	9.27	10.23
	Alkalinity, CaCO3		358	1900	90.4	771
	Bicarbonate		437	0	279	350
	Aluminum		0.073	<0.025	0.719	0.629
	Antimony		<0.003	<0.003	<0.003	<0.003
	Arsenic	0.05	0.08	<0.005	0.061	0.034
	Barium	2	0.05	0.14	0.069	<0.02
	Beryllium		<0.001	<0.001	<0.002	<0.002
	Boron		0.46	4.9		
	Cadmium	0.005	<0.002	<0.002	<0.002	<0.002
	Calcium		14	700	16	3.62
	Chloride	250	325	365	1360	1350
	Chromium	0.1	<0.01	<0.01	<0.005	<0.005
	Copper	1.3	0.02	0.32	0.013	0.085
	Fluoride	2	0.98	1.9	1.4	2.5
	Iron	0.3	<0.05	<0.05	0.374	0.309
	Lead	0.015	<0.002	<0.002	0.015	<0.007
	Magnesium	125	8.6	<25	14.1	6.11
	Manganese	0.05	0.18	<0.01	0.041	0.013
	Mercury	0.002	<0.0002	<0.0002	<0.0005	<0.0005
	Nickel		0.01	<0.01	<0.02	<0.02
	Nitrate Nitrogen	10	<1	<1	5.9	0.3
	Nitrite Nitrogen		<0.5	<0.5	<0.1	<0.1
	Potassium		15	29	7.36	15.8
	Selenium	0.05	0.011	<0.005	0.036	0.032
	Silver	0.1	<0.01	<0.01	<0.010	<0.010
	Sodium		930	420	1110	1330
	Sulfate	250	800	800	654	444
	Thallium		<0.001	<0.001	<0.001	<0.001
	TDS	500-1000	1940	1940	3960	4520
	Cyanide, WAD	0.2	<0.01	0.042	0.025	<0.025
	Zinc	5	<0.05	<0.05	<0.05	<0.05
	Bismuth		<0.5	<0.5	<0.2	<0.2
	Cobalt		<0.5	<0.5	0.046	0.034
	Gallium		<0.5	<0.5	<0.05	<0.05
	Lithium		<0.5	<0.5	0.059	0.038
	Molybdenum		<0.25	<0.25	0.032	0.055
	Phosphorus		<0.5	<0.5	<0.05	<0.05
	Scandium		<0.5	<0.5	<0.002	<0.002
	Strontium		<0.5	<0.5	0.375	0.036
	Tin		<0.5	<0.5	<0.05	<0.05
	Titanium		<0.1	<0.1	0.005	<0.005
	Vanadium		<0.15	<0.15	<0.02	<0.02
	Cyanide, WAD mg/kg		<.2	110		

Note: Shading indicates an exceedance

TABLE B-4
WESTERN STATES MINERALS CORPORATION
SOIL CHARACTERIZATION RESULTS

	PARAMETER	Limit mg/l	HG1 EDGE	HG2 EDGE	HG3 EDGE	HG6 EDGE	SOIL #1	SOIL #2	SOIL #3	SOIL #4	SOIL #5	SOIL #6	SOIL #7	SOIL #8	SOIL #9
Meteoric Water Mobility Procedure - Solution Analysis	pH	6.5-8.5	8.07	8.36	8.18	8.38									
	Alkalinity, CaCO3		142	165	173	140									
	Bicarbonate		173	189	211	171									
	Aluminum		0.53	0.35	0.5	<0.025									
	Antimony		<0.003	<0.003	<0.003	<0.003									
	Arsenic	0.05	<0.005	<0.005	0.029	0.054									
	Barium	2	0.15	0.06	0.08	0.03									
	Beryllium		<0.001	<0.001	<0.001	<0.001									
	Boron		2.1	2.2	0.14	0.3									
	Cadmium	0.005	<0.003	<0.003	<0.003	<0.003									
	Calcium		580	140	250	9									
	Chloride	250	2130	180	1215	130									
	Chromium	0.1	<0.01	<0.01	<0.01	<0.01									
	Copper	1.3	<0.01	0.01	0.02	0.01									
	Fluoride	2	1.8	1.5	0.56	0.69									
	Iron	0.3	<0.05	<0.05	<0.05	<0.05									
	Lead	0.015	<0.002	<0.002	<0.002	<0.002									
	Magnesium	125	75	12	39	1									
	Manganese	0.05	<0.01	<0.01	<0.01	<0.01									
	Mercury	0.002	<0.0002	<0.0002	<0.0002	<0.0002									
	Nickel		<0.01	0.02	0.04	<0.01									
	Nitrate Nitrogen	10	30	12	<1	1.2									
	Nitrite Nitrogen		<0.5	<0.5	<0.5	<0.5									
	Potassium		28	23	10	13									
	Selenium	0.05	<0.005	<0.005	<0.005	<0.005									
	Silver	0.1	<0.01	<0.01	<0.01	<0.01									
	Sodium		170	840	860	78									
	Sulfate	250	1940	1930	780	100									
	Thallium		<0.001	<0.001	<0.001	<0.001									
	TDS	500-1000	6600	3380	3410	430									
	Cyanide, WAD	0.2	0.072	<0.005	0.01	0.012									
	Zinc	5	<0.05	<0.05	<0.05	<0.05									
	Bismuth		<0.5	<0.5	<0.5	<0.5									
	Cobalt		<0.5	<0.5	<0.5	<0.5									
	Gallium		<0.5	<0.5	<0.5	<0.5									
	Lithium		<0.5	<0.5	<0.5	<0.5									
	Molybdenum		<0.25	<0.25	<0.25	<0.25									
	Phosphorus		0.84	0.77	<0.5	0.98									
	Scandium		<0.5	<0.5	<0.5	<0.5									
	Strontium		6.4	1.7	2.8	<0.5									
	Tin		<0.5	<0.5	<0.5	<0.5									
	Titanium		<0.1	<0.1	<0.1	<0.1									
	Vanadium		<0.15	<0.15	<0.15	<0.15									
Growth Media Testing	Soil Test Results:														
	Texture						Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Loamy Sand	Loamy Sand	Sandy Loam	Sandy Loam
	Lime						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
	pH						8.2	8	8.7	8.4	8.1	7.9	8.5	8	8.1
	Salinity - ECe (mmhos/cm)						0.4	0.4	0.7	5.6	0.3	4.6	1.4	20	1.4
	Phosphorus						2.2	1	2.5	1.3	1.9	1.6	1.6	3.2	2.4
	Potassium						174	80	97	81	179	46	111	57	218
	Nitrate - Nitrogen						2.8	1.5	1.5	9.3	1.5	1.3	5.2	6	24.2
	SAR						3	0.69	15	24	2.36	7.58	15	36	2.78
	Organic Matter, %						0.76	0.68	0.51	0.43	0.83	0.31	0.58	0.49	0.51
	CEC, meq/100g						16.2	13.8	19.5	12.3	15.9	30.1	21	9.3	9.3
	Sodic						NO	NO	YES	YES	NO	NO	YES	YES	NO

Note: Shading indicates an exceedance

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19650
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/16/98
Number of Samples: 3
Source: 2591 M-1 LG1 Comp III
Chemax Control No. 98-4053 thru 4055
Notes: **PROFILE II**

Date Submitted: 06/16/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	7.91
Alkalinity, mg/L as $CaCO_3$	46
Bicarbonate, mg/L	56
Aluminum, mg/L	0.16
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.11
Beryllium, mg/L	<0.001
Boron, mg/L	0.17
Cadmium, mg/L	<0.003
Calcium, mg/L	38
Chloride, mg/L	60
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab

Date: 07/08/98

Approved By:

Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-1 LG1 Comp III
Lab Report No.: 19650

Parameter	Results
Fluoride, mg/L	0.85
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	7.9
Manganese, mg/L	0.02
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.4
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	63
Sulfate, mg/L	190
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	630
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 6.37 6.61 1.9

Remarks:

Analysis By: Eckert/Joyce/Stowers/aqualab/Accu-Lab
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-1 LG1 Comp III

Lab Report No.: 19650

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.90
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/08/98

Approved By:

Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19651
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/16/98
Number of Samples: 3
Source: 2591 M-2 LG2-1 Comp III
Chemax Control No. 98-4056 thru 4058
Notes: **PROFILE II**

Date Submitted: 06/16/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.36
Alkalinity, mg/L as $CaCO_3$	44
Bicarbonate, mg/L	51
Aluminum, mg/L	1.2
Antimony, mg/L	<0.003
Arsenic, mg/L	0.024
Barium, mg/L	0.20
Beryllium, mg/L	<0.001
Boron, mg/L	0.12
Cadmium, mg/L	<0.003
Calcium, mg/L	3.5
Chloride, mg/L	70
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/08/98

Approved By: Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-2 LG2-1 Comp III
Lab Report No.: 19651

Parameter	Results
Fluoride, mg/L	0.47
Iron, mg/L	0.31
Lead, mg/L	<0.002
Magnesium, mg/L	0.6
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	3.6
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.1
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	87
Sulfate, mg/L	55
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	320
Cyanide, WAD, mg/L	0.018
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 4.06 4.27 2.5

Remarks:

Analysis By: Eckert/Joyce/Stowers/aqualab/Accu-Lab
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-2 LG2-1 Comp III

Lab Report No.: 19651

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.86
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/08/98

Approved By:

Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19652
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/16/98
Number of Samples: 3
Source: 2591 M-3 LG2-2 Comp III
Chemax Control No. 98-4059 thru 4061
Notes: **PROFILE II**

Date Submitted: 06/16/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.73
Alkalinity, mg/L as $CaCO_3$	41
Bicarbonate, mg/L	46
Aluminum, mg/L	1.8
Antimony, mg/L	<0.003
Arsenic, mg/L	0.045
Barium, mg/L	0.18
Beryllium, mg/L	<0.001
Boron, mg/L	0.14
Cadmium, mg/L	<0.003
Calcium, mg/L	3.1
Chloride, mg/L	45
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/08/98

Approved By: Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-3 LG2-2 Comp III

Lab Report No.: 19652

Parameter	Results
Fluoride, mg/L	0.53
Iron, mg/L	0.76
Lead, mg/L	<0.002
Magnesium, mg/L	<0.5
Manganese, mg/L	0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.8
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.6
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	56
Sulfate, mg/L	40
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	310
Cyanide, WAD, mg/L	0.013
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.87 3.17 5.0

Remarks:

Analysis By: Eckert/Joyce/Stowers/aqualab/Accu-Lab
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-3 LG2-2 Comp III

Lab Report No.: 19652

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19653
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/16/98
Number of Samples: 3
Source: 2591 M-4 LG2-3 Comp III
Chemax Control No. 98-4062 thru 4064

Date Submitted: 06/16/98
Sampled By: Client
Your Reference:

Notes: **PROFILE II**

Parameter	Results
pH	7.64
Alkalinity, mg/L as $CaCO_3$	52
Bicarbonate, mg/L	63
Aluminum, mg/L	0.22
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.08
Beryllium, mg/L	<0.001
Boron, mg/L	0.07
Cadmium, mg/L	<0.003
Calcium, mg/L	83
Chloride, mg/L	140
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-4 LG2-3 Comp III
Lab Report No.: 19653

Parameter	Results
Fluoride, mg/L	0.20
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	15
Manganese, mg/L	0.48
Mercury, mg/L	<0.0002
Nickel, mg/L	0.01
Nitrate Nitrogen, mg/L	4.1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	3.5
Selenium, mg/L	0.011
Silver, mg/L	<0.01
Sodium, mg/L	160
Sulfate, mg/L	400
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	840
Cyanide, WAD, mg/L	0.011
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 12.3 13.6 5.0

Remarks:

Analysis By: Eckert/Joyce/Stowers/aqualab/Accu-Lab
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-4 LG2-3 Comp III

Lab Report No.: 19653

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.92
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/08/98

Approved By:
Date: 07/08/98

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CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19654
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/16/98
Number of Samples: 3
Source: 2591 M-5 LG3-1
Chemax Control No. 98-4065 thru 4067
Notes: **PROFILE II**

Date Submitted: 06/16/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.27
Alkalinity, mg/L as $CaCO_3$	34
Bicarbonate, mg/L	41
Aluminum, mg/L	0.30
Antimony, mg/L	<0.003
Arsenic, mg/L	0.025
Barium, mg/L	0.26
Beryllium, mg/L	<0.001
Boron, mg/L	0.15
Cadmium, mg/L	<0.003
Calcium, mg/L	5.0
Chloride, mg/L	29
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/08/98

Approved By: Date: 07/08/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-5 LG3-1
Lab Report No.: 19654

Parameter	Results
Fluoride, mg/L	0.31
Iron, mg/L	0.11
Lead, mg/L	<0.002
Magnesium, mg/L	0.80
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.7
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	43
Sulfate, mg/L	45
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	210
Cyanide, WAD, mg/L	0.014
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.23 2.44 4.5

Remarks:

Analysis By: Eckert/Joyce/Stowers/aqualab/Accu-Lab
Date: 07/08/98

Approved By:
Date: 07/08/98

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CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
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Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{C} Clelland Laboratories, Inc.
Source: 2591 M-5 LG3-1

Lab Report No.: 19654

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/08/98

Approved By:
Date: 07/08/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19724
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/19/98
Number of Samples: 3
Source: 2591 M-6 LG3-2 Comp III
Chemax Control No. 98-4256 thru 4258

Date Submitted: 06/22/98
Sampled By: Client
Your Reference:

Notes: **PROFILE II**

Parameter	Results
pH	7.44
Alkalinity, mg/L as $CaCO_3$	36
Bicarbonate, mg/L	40
Aluminum, mg/L	0.36
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.12
Beryllium, mg/L	<0.001
Boron, mg/L	0.08
Cadmium, mg/L	<0.003
Calcium, mg/L	40
Chloride, mg/L	99
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab

Date: 07/24/98

Approved By:

Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-6 LG3-2 Comp III
Lab Report No.: 19724

Parameter	Results
Fluoride, mg/L	0.35
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	6.2
Manganese, mg/L	0.02
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	3.1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	140
Sulfate, mg/L	240
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	730
Cyanide, WAD, mg/L	0.021
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 8.60 8.83 1.3

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-6 LG3-2 Comp III

Lab Report No.: 19724

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.98
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19725
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/19/98
Number of Samples: 3
Source: 2591 M-7 LG3-3 Comp III
Chemax Control No. 98-4259 thru 4261
Notes: **PROFILE II**

Date Submitted: 06/22/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	7.77
Alkalinity, mg/L as $CaCO_3$	58
Bicarbonate, mg/L	71
Aluminum, mg/L	0.86
Antimony, mg/L	<0.003
Arsenic, mg/L	0.023
Barium, mg/L	0.14
Beryllium, mg/L	<0.001
Boron, mg/L	0.18
Cadmium, mg/L	<0.003
Calcium, mg/L	3.8
Chloride, mg/L	38
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/24/98

Approved By: Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-6 LG3-3 Comp III
Lab Report No.: 19725

Parameter	Results
Fluoride, mg/L	0.58
Iron, mg/L	0.12
Lead, mg/L	<0.002
Magnesium, mg/L	0.6
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.2
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.9
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	73
Sulfate, mg/L	93
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	300
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 3.46 4.39 10

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-7 LG3-3 Comp III

Lab Report No.: 19725

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19726
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/19/98
Number of Samples: 3
Source: 2591 M-8 HG6-1 Comp III
Chemax Control No. 98-4262 thru 4264
Notes: **PROFILE II**

Date Submitted: 06/22/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	7.06
Alkalinity, mg/L as $CaCO_3$	48
Bicarbonate, mg/L	59
Aluminum, mg/L	3.2
Antimony, mg/L	<0.003
Arsenic, mg/L	0.028
Barium, mg/L	0.23
Beryllium, mg/L	<0.001
Boron, mg/L	0.15
Cadmium, mg/L	<0.003
Calcium, mg/L	5.5
Chloride, mg/L	1.3
Chromium, mg/L	<0.01
Copper, mg/L	0.02

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/24/98

Approved By: Date: 07/24/98

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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-8 HG6-1 Comp III
Lab Report No.: 19726

Parameter	Results
Fluoride, mg/L	0.32
Iron, mg/L	2.1
Lead, mg/L	0.019
Magnesium, mg/L	2.2
Manganese, mg/L	0.04
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.6
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	18
Sulfate, mg/L	8.0
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	67
Cyanide, WAD, mg/L	<0.005
Zinc, mg/L	0.06
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 1.28 1.19 3.7

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-8 HG6-1 Comp III
Lab Report No.: 19726

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19727
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/19/98
Number of Samples: 3
Source: 2591 M-9 HG6-2 Comp III
Chemax Control No. 98-4265 thru 4267
Notes: **PROFILE II**

Date Submitted: 06/22/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	7.58
Alkalinity, mg/L as $CaCO_3$	45
Bicarbonate, mg/L	55
Aluminum, mg/L	0.82
Antimony, mg/L	<0.003
Arsenic, mg/L	0.039
Barium, mg/L	0.21
Beryllium, mg/L	<0.001
Boron, mg/L	0.12
Cadmium, mg/L	<0.003
Calcium, mg/L	4.5
Chloride, mg/L	1.2
Chromium, mg/L	<0.01
Copper, mg/L	0.02

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/24/98

Approved By: Date: 07/24/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-9 HG6-2 Comp III

Lab Report No.: 19727

Parameter	Results
Fluoride, mg/L	0.27
Iron, mg/L	0.53
Lead, mg/L	0.005
Magnesium, mg/L	1.1
Manganese, mg/L	0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	17
Sulfate, mg/L	7.0
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	60
Cyanide, WAD, mg/L	<0.005
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 1.08 1.10 0.69

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs

Date: 07/24/98

Approved By:

Date: 07/24/98

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LABORATORY REPORT

Report To: M^C Clelland Laboratories, Inc.
Source: 2591 M-9 HG6-2 Comp III

Lab Report No.: 19727

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/24/98

Approved By:
Date: 07/24/98

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EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19728
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/19/98 Date Submitted: 06/22/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-10 HG7-2 Comp III Your Reference:
Chemax Control No. 98-4268 thru 4270
Notes: **PROFILE II**

Parameter	Results
pH	7.80
Alkalinity, mg/L as $CaCO_3$	50
Bicarbonate, mg/L	61
Aluminum, mg/L	0.52
Antimony, mg/L	<0.003
Arsenic, mg/L	0.022
Barium, mg/L	0.13
Beryllium, mg/L	<0.001
Boron, mg/L	0.09
Cadmium, mg/L	<0.003
Calcium, mg/L	4.3
Chloride, mg/L	35
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 07/24/98

Approved By:  Date: 07/24/98

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Analytical and Environmental Chemists

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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-10 HG7-2 Comp III

Lab Report No.: 19728

Parameter	Results
Fluoride, mg/L	0.40
Iron, mg/L	0.07
Lead, mg/L	<0.002
Magnesium, mg/L	0.80
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.7
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.3
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	60
Sulfate, mg/L	87
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	260
Cyanide, WAD, mg/L	0.030
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.98 3.94 14

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs

Date: 07/24/98

Approved By:

Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-10 HG7-2 Comp III

Lab Report No.: 19728

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.96
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/24/98

Approved By:
Date: 07/24/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19778
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/23/98
Number of Samples: 3
Source: 2591 M-11 HG7-1
Chemax Control No. 98-4337 thru 4339
Notes: **PROFILE II**

Date Submitted: 06/24/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.69
Alkalinity, mg/L as $CaCO_3$	66*
Bicarbonate, mg/L	71
Aluminum, mg/L	2.3
Antimony, mg/L	<0.003
Arsenic, mg/L	0.056
Barium, mg/L	0.28
Beryllium, mg/L	<0.001
Boron, mg/L	0.33
Cadmium, mg/L	<0.003
Calcium, mg/L	7.4
Chloride, mg/L	77
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 4.8 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab

Date: 08/03/98

Approved By:

Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19778
Source: 2591 M-11 HG7-1

Parameter	Results
Fluoride, mg/L	0.82
Iron, mg/L	1.1
Lead, mg/L	0.018
Magnesium, mg/L	1.9
Manganese, mg/L	0.02
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	4.6
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	3.5
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	110
Sulfate, mg/L	42
Thallium, mg/L	0.001
Total Dissolved Solids, mg/L	350
Cyanide, WAD, mg/L	0.051
Zinc, mg/L	0.08
Cation-Anion Balance:	
Cations, meq/L	5.18
Anions, meq/L	4.74
% Error	4.5

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs Date: 08/03/98

Approved By: Date: 08/03/98

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Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-11 HG7-1

Lab Report No.: 19778

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.80
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/03/98

Approved By:

Date: 08/03/98

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EPA Lab ID #NV004

(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19779
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/23/98 Date Submitted: 06/24/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-12 HG7-3 Comp III Your Reference:
Chemax Control No. 98-4340 thru 4342
Notes: **PROFILE II**

Parameter	Results
pH	8.92
Alkalinity, mg/L as $CaCO_3$	65*
Bicarbonate, mg/L	62
Aluminum, mg/L	2.9
Antimony, mg/L	<0.003
Arsenic, mg/L	0.19
Barium, mg/L	0.24
Beryllium, mg/L	<0.001
Boron, mg/L	0.19
Cadmium, mg/L	<0.003
Calcium, mg/L	6.7
Chloride, mg/L	46
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 8.4 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/03/98

Approved By: Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-12 HG7-3 Comp III

Lab Report No.: 19779

Parameter	Results
Fluoride, mg/L	0.66
Iron, mg/L	0.86
Lead, mg/L	0.011
Magnesium, mg/L	1.7
Manganese, mg/L	0.03
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.3
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.2
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	70
Sulfate, mg/L	32
Thallium, mg/L	0.001
Total Dissolved Solids, mg/L	290
Cyanide, WAD, mg/L	0.031
Zinc, mg/L	0.06
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 3.58 3.38 2.7

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs

Date: 08/03/98

Approved By:

Date: 08/03/98

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CHEMAX Laboratories, Inc.

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EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{C} Clelland Laboratories, Inc.
Source: 2591 M-12 HG7-3 Comp III

Lab Report No.: 19779

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/03/98

Approved By:

Date: 08/03/98

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EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{C} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19780
Account No.: MCCLD

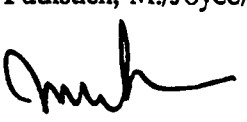
Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{C} Clelland
Date Sampled: 06/23/98 Date Submitted: 06/24/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-13 HG7-4 Comp III Your Reference:
Chemax Control No. 98-4343 thru 4345
Notes: **PROFILE II**

Parameter	Results
pH	8.36
Alkalinity, mg/L as $CaCO_3$	44
Bicarbonate, mg/L	51
Aluminum, mg/L	0.16
Antimony, mg/L	<0.003
Arsenic, mg/L	0.055
Barium, mg/L	0.19
Beryllium, mg/L	<0.001
Boron, mg/L	0.09
Cadmium, mg/L	<0.003
Calcium, mg/L	3.3
Chloride, mg/L	95
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 1.2 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/03/98

Approved By:  Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-13 HG7-4 Comp III

Lab Report No.: 19780

Parameter	Results
Fluoride, mg/L	0.58
Iron, mg/L	0.11
Lead, mg/L	<0.002
Magnesium, mg/L	0.7
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	5.1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	110
Sulfate, mg/L	80
Thallium, mg/L	0.001
Total Dissolved Solids, mg/L	370
Cyanide, WAD, mg/L	0.044
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 5.19 5.61 3.9

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs

Date: 08/03/98

Approved By:

Date: 08/03/98

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EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-13 HG7-4 Comp III

Lab Report No.: 19780

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.73
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/03/98

Approved By:

Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

(702) 355-0202
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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19781
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/23/98 Date Submitted: 06/24/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-14 HG1-1 Comp III Your Reference:
Chemax Control No. 98-4346 thru 4348
Notes: **PROFILE II**

Parameter	Results
pH	9.03
Alkalinity, mg/L as $CaCO_3$	93*
Bicarbonate, mg/L	94
Aluminum, mg/L	1.4
Antimony, mg/L	<0.003
Arsenic, mg/L	0.094
Barium, mg/L	0.18
Beryllium, mg/L	<0.001
Boron, mg/L	0.21
Cadmium, mg/L	<0.003
Calcium, mg/L	1.7
Chloride, mg/L	43
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 9.6 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/03/98

Approved By: Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19781
Source: 2591 M-14 HG1-1 Comp III

Parameter	Results
Fluoride, mg/L	0.82
Iron, mg/L	0.94
Lead, mg/L	0.007
Magnesium, mg/L	0.8
Manganese, mg/L	0.07
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.7
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	64
Sulfate, mg/L	29
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	290
Cyanide, WAD, mg/L	0.010
Zinc, mg/L	0.11
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 3.21 3.80 8.4

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs Date: 08/03/98

Approved By: Date: 08/03/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-14 HG1-1 Comp III

Lab Report No.: 19781

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/03/98

Approved By:

Date: 08/03/98

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19782
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/23/98 Date Submitted: 06/24/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-15 HG1-2 Comp III Your Reference:
Chemax Control No. 98-4349 thru 4351
Notes: **PROFILE II**

Parameter	Results
pH	8.77
Alkalinity, mg/L as $CaCO_3$	64*
Bicarbonate, mg/L	68
Aluminum, mg/L	0.12
Antimony, mg/L	<0.003
Arsenic, mg/L	0.028
Barium, mg/L	0.18
Beryllium, mg/L	<0.001
Boron, mg/L	0.15
Cadmium, mg/L	<0.003
Calcium, mg/L	2.3
Chloride, mg/L	57
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 4.8 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/03/98

Approved By: Date: 08/03/98

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Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-15 HG1-2 Comp III

Lab Report No.: 19782

Parameter	Results
Fluoride, mg/L	0.96
Iron, mg/L	0.06
Lead, mg/L	<0.002
Magnesium, mg/L	0.5
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L as N	2.2
Nitrite Nitrogen, mg/L as N	<0.5
Potassium, mg/L	2.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	91
Sulfate, mg/L	53
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	280
Cyanide, WAD, mg/L	0.021
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 4.17 4.19 0.28

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs

Date: 08/03/98

Approved By:

Date: 08/03/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-15 HG1-2 Comp III

Lab Report No.: 19782

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.73
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/03/98

Approved By:

Date: 08/03/98

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CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
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LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19767
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^c Clelland
Date Sampled: 06/30/98
Number of Samples: 3
Source: 2591 M-16 HG2-1
Chemax Control No. 98-4465 thru 4467
Notes: **PROFILE II**

Date Submitted: 06/30/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.65
Alkalinity, mg/L as $CaCO_3$	47
Bicarbonate, mg/L	48
Aluminum, mg/L	0.06
Antimony, mg/L	<0.003
Arsenic, mg/L	0.014
Barium, mg/L	0.16
Beryllium, mg/L	<0.001
Boron, mg/L	0.10
Cadmium, mg/L	<0.003
Calcium, mg/L	2.3
Chloride, mg/L	44
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab

Date: 07/29/98

Approved By:

Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
(702) 355-0202
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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19767
Source: 2591 M-16 HG2-1

Parameter	Results
Fluoride, mg/L	0.38
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	<0.5
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.7
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.7
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	68
Sulfate, mg/L	30
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	130
Cyanide, WAD, mg/L	0.026
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 3.12 2.95 2.7

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs Date: 07/29/98

Approved By: Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-16 HG2-1
Lab Report No.: 19767

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert
Date: 07/29/98

Approved By:
Date: 07/29/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19768
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/30/98
Number of Samples: 3
Source: 2591 M-17 HG2-2
Chemax Control No. 98-4468 thru 4470
Notes: **PROFILE II**

Date Submitted: 06/30/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.95
Alkalinity, mg/L as $CaCO_3$	74*
Bicarbonate, mg/L	76
Aluminum, mg/L	0.04
Antimony, mg/L	<0.003
Arsenic, mg/L	0.021
Barium, mg/L	0.16
Beryllium, mg/L	<0.001
Boron, mg/L	0.21
Cadmium, mg/L	<0.003
Calcium, mg/L	1.6
Chloride, mg/L	73
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 7.2 mg/L.

Analysis By: Faulstich, M./Joyce/aqualab

Date: 07/29/98

Approved By:

Date: 07/29/98

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CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19768
Source: 2591 M-17 HG2-2

Parameter	Results
Fluoride, mg/L	0.62
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	<0.5
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L as N	1.7
Nitrite Nitrogen, mg/L as N	<0.5
Potassium, mg/L	1.9
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	100
Sulfate, mg/L	44
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	200
Cyanide, WAD, mg/L	0.013
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 4.57 4.61 0.47

Remarks:

Analysis By: Eckert/Faulstich, M./Joyce/aqualab/Accu-Labs Date: 07/29/98

Approved By: Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.

Analytical and Environmental Chemists
EPA Lab ID #NV004

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Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-17 HG2-2

Lab Report No.: 19768

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/29/98

Approved By:

Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19845
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/06/98
Number of Samples: 3
Source: 2591 M-18 H63-1
Sample ID: 5-807-021-04 thru -06
Notes: **PROFILE II**

Date Submitted: 07/06/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	7.66
Alkalinity, mg/L as $CaCO_3$	100
Bicarbonate, mg/L	122
Aluminum, mg/L	1.2
Antimony, mg/L	<0.003
Arsenic, mg/L	0.096
Barium, mg/L	0.15
Beryllium, mg/L	<0.001
Boron, mg/L	0.20
Cadmium, mg/L	<0.002
Calcium, mg/L	5.1
Chloride, mg/L	10
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19845
Source: 2591 M-18 H63-1

Parameter	Results
Fluoride, mg/L	0.57
Iron, mg/L	0.56
Lead, mg/L	0.003
Magnesium, mg/L	0.8
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	1.9
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	65
Sulfate, mg/L	18
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	190
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 3.20 2.67 8.7

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-18 H63-1

Lab Report No.: 19845

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19846
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/06/98
Number of Samples: 3
Source: 2591 M-19 H63-2
Sample ID: 5-807-021-01 thru -03

Date Submitted: 07/06/98
Sampled By: Client
Your Reference:

Notes: **PROFILE II**

Parameter	Results
pH	7.51
Alkalinity, mg/L as $CaCO_3$	66
Bicarbonate, mg/L	80
Aluminum, mg/L	0.78
Antimony, mg/L	<0.003
Arsenic, mg/L	0.083
Barium, mg/L	0.19
Beryllium, mg/L	<0.001
Boron, mg/L	0.17
Cadmium, mg/L	<0.002
Calcium, mg/L	2.9
Chloride, mg/L	16
Chromium, mg/L	<0.01
Copper, mg/L	0.04

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19846
Source: 2591 M-19 H63-2

Parameter	Results
Fluoride, mg/L	0.28
Iron, mg/L	0.39
Lead, mg/L	0.004
Magnesium, mg/L	0.7
Manganese, mg/L	0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	48
Sulfate, mg/L	13
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	110
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.34 2.05 6.7

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19846
Source: 2591 M-19 H63-2

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Approved By:

Date: 08/20/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19862
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/12/98
Number of Samples: 3
Source: 2591 M-20 HG 4 & 5-1
Sample ID: 5-807-040-01 thru -03

Date Submitted: 07/13/98
Sampled By: Client

Notes: **PROFILE II**

Parameter	Results
pH	8.21
Alkalinity, mg/L as $CaCO_3$	92
Bicarbonate, mg/L	112
Aluminum, mg/L	1.1
Antimony, mg/L	<0.003
Arsenic, mg/L	0.081
Barium, mg/L	0.17
Beryllium, mg/L	<0.001
Boron, mg/L	0.16
Cadmium, mg/L	<0.002
Calcium, mg/L	6.7
Chloride, mg/L	22
Chromium, mg/L	<0.01
Copper, mg/L	0.03

Remarks:

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19862
Source: 2591 M-20 HG 4 & 5-1

Parameter	Results
Fluoride, mg/L	0.33
Iron, mg/L	0.72
Lead, mg/L	0.006
Magnesium, mg/L	1.4
Manganese, mg/L	0.02
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.2
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	41
Sulfate, mg/L	16
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	180
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.29 2.80 10

Remarks:

Approved By: Date: 08/26/98

Acculabs Inc.
Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817
EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19862
Source: 2591 M-20 HG 4 & 5-1

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert Date: 07/29/98

Approved By: Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19863
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/12/98
Number of Samples: 3
Source: 2591 M-21 HG 4 & 5-2
Sample ID: 5-807-040-04 thru -06

Date Submitted: 07/13/98
Sampled By: Client

Notes: **PROFILE II**

Parameter	Results
pH	8.58
Alkalinity, mg/L as $CaCO_3$	90
Bicarbonate, mg/L	110
Aluminum, mg/L	0.40
Antimony, mg/L	<0.003
Arsenic, mg/L	0.16
Barium, mg/L	0.16
Beryllium, mg/L	<0.001
Boron, mg/L	0.19
Cadmium, mg/L	<0.002
Calcium, mg/L	2.3
Chloride, mg/L	57
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19863
Source: 2591 M-21 HG 4 & 5-2

Parameter	Results
Fluoride, mg/L	0.58
Iron, mg/L	0.20
Lead, mg/L	<0.002
Magnesium, mg/L	<0.5
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.0
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	92
Sulfate, mg/L	31
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	500
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 4.17 4.16 0.10

Remarks:

Approved By: Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-21 HG 4 & 5-2

Lab Report No.: 19863

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/29/98

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19864
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/12/98
Number of Samples: 3
Source: 2591 M-22 HG 4 & 5-3
Sample ID: 5-807-040-07 thru -09

Date Submitted: 07/13/98
Sampled By: Client

Notes: **PROFILE II**

Parameter	Results
pH	8.21
Alkalinity, mg/L as $CaCO_3$	96
Bicarbonate, mg/L	117
Aluminum, mg/L	1.8
Antimony, mg/L	<0.003
Arsenic, mg/L	0.013
Barium, mg/L	0.18
Beryllium, mg/L	<0.001
Boron, mg/L	0.17
Cadmium, mg/L	<0.002
Calcium, mg/L	5.3
Chloride, mg/L	1.4
Chromium, mg/L	<0.01
Copper, mg/L	0.06

Remarks:

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-22 HG 4 & 5-3

Lab Report No.: 19864

Parameter	Results
Fluoride, mg/L	0.35
Iron, mg/L	0.99
Lead, mg/L	0.006
Magnesium, mg/L	1.5
Manganese, mg/L	0.03
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	2.3
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	37
Sulfate, mg/L	7.0
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	200
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	0.11
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 2.06 2.12 1.6

Remarks:

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-22 HG 4 & 5-3

Lab Report No.: 19864

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/29/98

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19816
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/07/98
Number of Samples: 3
Source: 2591 M-23 Perimeter HG-3
Sample ID: 5-807-029-01 thru -03

Date Submitted: 07/07/98
Sampled By: Client
Your Reference:

Notes: **PROFILE II**

Parameter	Results
pH	8.18
Alkalinity, mg/L as $CaCO_3$	173
Bicarbonate, mg/L	211
Aluminum, mg/L	0.50
Antimony, mg/L	<0.003
Arsenic, mg/L	0.029
Barium, mg/L	0.08
Beryllium, mg/L	<0.001
Boron, mg/L	1.4
Cadmium, mg/L	<0.003
Calcium, mg/L	250
Chloride, mg/L	1,215
Chromium, mg/L	<0.01
Copper, mg/L	0.02

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab

Date: 08/11/98

Approved By:

Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19816
Source: 2591 M-23 Perimeter HG-3

Parameter	Results
Fluoride, mg/L	0.56
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	39
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	0.04
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<62.5*
Potassium, mg/L	10
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	860
Sulfate, mg/L	780
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	3,410
Cyanide, WAD, mg/L	0.010
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 53.5 53.9 0.35

Remarks: * High reporting limit on Nitrite Nitrogen due to large Chloride peak on ion chromatogram.

Analysis By: Faulstich, M./Joyce/aqualab/Accu-Labs Date: 08/11/98

Approved By: Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-23 Perimeter HG-3

Lab Report No.: 19816

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	2.8
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/11/98

Approved By:

Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19817
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/07/98
Number of Samples: 3
Source: 2591 M-24 Perimeter HG-2
Sample ID: 5-807-029-04 thru -06
Notes: **PROFILE II**

Date Submitted: 07/07/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.36
Alkalinity, mg/L as $CaCO_3$	165
Bicarbonate, mg/L	189
Aluminum, mg/L	0.35
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.06
Beryllium, mg/L	<0.001
Boron, mg/L	2.2
Cadmium, mg/L	<0.003
Calcium, mg/L	140
Chloride, mg/L	180
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/11/98

Approved By: Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

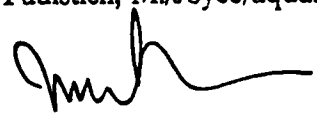
LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19817
Source: 2591 M-24 Perimeter HG-2

Parameter	Results
Fluoride, mg/L	1.5
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	12
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	0.02
Nitrate Nitrogen, mg/L	12
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	23
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	840
Sulfate, mg/L	1,930
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	3,380
Cyanide, WAD, mg/L	<0.005
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 45.0 49.4 4.8

Remarks: * High reporting limit on Nitrite Nitrogen due to large Chloride peak on ion chromatogram.

Analysis By: Faulstich, M./Joyce/aqualab/Accu-Labs Date: 08/11/98

Approved By:  Date: 08/11/98

Acculabs Inc.
Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817
EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-24 Perimeter HG-2

Lab Report No.: 19817

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.77
Scandium, mg/L	<0.5
Strontium, mg/L	1.7
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 08/11/98

Approved By:

Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19818
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/07/98
Number of Samples: 3
Source: 2591 M-25 Perimeter HG-2
Sample ID: 5-807-029-07 thru -09
Notes: **PROFILE II**

Date Submitted: 07/07/98
Sampled By: Client
Your Reference:

Parameter	Results
pH	8.07
Alkalinity, mg/L as $CaCO_3$	142
Bicarbonate, mg/L	173
Aluminum, mg/L	0.53
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.15
Beryllium, mg/L	<0.001
Boron, mg/L	2.1
Cadmium, mg/L	<0.003
Calcium, mg/L	580
Chloride, mg/L	2,130
Chromium, mg/L	<0.01
Copper, mg/L	<0.01

Remarks:

Analysis By: Faulstich, M./Joyce/aqualab Date: 08/11/98

Approved By: Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19818
Source: 2591 M-25 Perimeter HG-2

Parameter	Results
Fluoride, mg/L	1.8
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	75
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	30
Nitrite Nitrogen, mg/L	<62.5*
Potassium, mg/L	28
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	170
Sulfate, mg/L	1,940
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	6,600
Cyanide, WAD, mg/L	0.072
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 110 105 2.0

Remarks: * High reporting limit on Nitrite Nitrogen due to large Chloride peak on ion chromatogram.

Analysis By: Faulstich, M./Joyce/aqualab/Accu-Labs Date: 08/11/98

Approved By: Date: 08/11/98

Acculabs Inc.
Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817
EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-25 Perimeter HG-2

Lab Report No.: 19818

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.84
Scandium, mg/L	<0.5
Strontium, mg/L	6.4
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Approved By:

Date: 08/11/98

Date: 08/11/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19838
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/09/98
Number of Samples: 3
Source: 2591 M-26 Perimeter HG-6
Sample ID: 5-807-035-01 thru -03

Date Submitted: 07/09/98
Sampled By: Client
Your Reference:

Notes: **PROFILE II**

Parameter	Results
pH	8.38
Alkalinity, mg/L as $CaCO_3$	140
Bicarbonate, mg/L	171
Aluminum, mg/L	<0.025
Antimony, mg/L	<0.003
Arsenic, mg/L	0.054
Barium, mg/L	0.03
Beryllium, mg/L	<0.001
Boron, mg/L	0.30
Cadmium, mg/L	<0.003
Calcium, mg/L	9.0
Chloride, mg/L	130
Chromium, mg/L	<0.01
Copper, mg/L	0.01

Remarks:

Approved By:

Date: 08/22/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19838
Source: 2591 M-26 Perimeter HG-6

Parameter	Results
Fluoride, mg/L	0.69
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	1.0
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	1.2
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	13
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	78
Sulfate, mg/L	100
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	430
Cyanide, WAD, mg/L	0.012
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 9.18 8.59 3.3

Remarks:

Approved By:

Date: 09/22/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-26 Perimeter HG-6

Lab Report No.: 19838

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	0.98
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/10/98

Approved By:

Date: 08/22/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19839
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/09/98 Date Submitted: 07/09/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-27 Drum Mine Preg Pond
Sample ID: 5-807-035-04 thru -06
Notes: **PROFILE II**

Parameter	Results
pH	8.29
Alkalinity, mg/L as $CaCO_3$	358
Bicarbonate, mg/L	437
Aluminum, mg/L	0.073
Antimony, mg/L	<0.003
Arsenic, mg/L	0.080
Barium, mg/L	0.05
Beryllium, mg/L	<0.001
Boron, mg/L	0.46
Cadmium, mg/L	<0.002
Calcium, mg/L	14
Chloride, mg/L	325
Chromium, mg/L	<0.01
Copper, mg/L	0.02

Remarks:

Approved By: 

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-27 Drum Mine Preg Pond

Lab Report No.: 19839

Parameter	Results
Fluoride, mg/L	0.98
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	8.6
Manganese, mg/L	0.18
Mercury, mg/L	<0.0002
Nickel, mg/L	0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	15
Selenium, mg/L	0.011
Silver, mg/L	<0.01
Sodium, mg/L	930
Sulfate, mg/L	800
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	1,940
Cyanide, WAD, mg/L	<0.01
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 42.2 33.0 12.3

Remarks:

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc. Lab Report No.: 19839
Source: 2591 M-27 Drum Mine Preg Pond

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert Date: 07/10/98

Approved By: Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19840
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/09/98 Date Submitted: 07/09/98
Number of Samples: 3 Sampled By: Client
Source: 2591 M-28 Drum Mine Barren Pond
Sample ID: 5-807-035-07 thru -09
Notes: **PROFILE II**

Parameter	Results
pH	12.09
Alkalinity, mg/L as $CaCO_3$	1900*
Bicarbonate, mg/L	0
Aluminum, mg/L	<0.025
Antimony, mg/L	<0.003
Arsenic, mg/L	<0.005
Barium, mg/L	0.14
Beryllium, mg/L	<0.001
Boron, mg/L	4.9
Cadmium, mg/L	<0.002
Calcium, mg/L	700
Chloride, mg/L	365
Chromium, mg/L	<0.01
Copper, mg/L	0.32

Remarks: * For purpose of ion balance calculations, CO_3^{2-} = 84 mg/L and OH^- = 599 mg/L.

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
Source: 2591 M-28 Drum Mine Barren Pond

Lab Report No.: 19840

Parameter	Results
Fluoride, mg/L	1.9
Iron, mg/L	<0.05
Lead, mg/L	<0.002
Magnesium, mg/L	<25*
Manganese, mg/L	<0.01
Mercury, mg/L	<0.0002
Nickel, mg/L	<0.01
Nitrate Nitrogen, mg/L	<1
Nitrite Nitrogen, mg/L	<0.5
Potassium, mg/L	29
Selenium, mg/L	<0.005
Silver, mg/L	<0.01
Sodium, mg/L	420
Sulfate, mg/L	800
Thallium, mg/L	<0.001
Total Dissolved Solids, mg/L	1,940
Cyanide, WAD, mg/L	0.042
Zinc, mg/L	<0.05
Cation-Anion Balance: Cations, meq/L Anions, meq/L % Error	 56.0 51.5 4.2

Remarks: * Due to matrix interference, sample was run at 1/100 dilution, hence the elevated reporting limit.

Approved By:

Date: 08/26/98

Acculabs Inc.

Sparks/Reno 992 Spice Islands Drive, Sparks NV 89431 ■ 702-355-0202 ■ Fax 355-0817

EPA Lab ID #NV004

LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
Source: 2591 M-28 Drum Mine Barren Pond

Lab Report No.: 19840

Parameter	Results
11-Element Semi-Quantitative ICP Scan	
Bismuth, mg/L	<0.5
Cobalt, mg/L	<0.5
Gallium, mg/L	<0.5
Lithium, mg/L	<0.5
Molybdenum, mg/L	<0.25
Phosphorus, mg/L	<0.5
Scandium, mg/L	<0.5
Strontium, mg/L	<0.5
Tin, mg/L	<0.5
Titanium, mg/L	<0.1
Vanadium, mg/L	<0.15

Remarks:

Analysis By: Eckert

Date: 07/10/98

Approved By:

Date: 08/26/98

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
EPA Lab ID #NV004
(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19776
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 06/18/98
Number of Samples: 13
Source: Job 2591
Chemax Control No. 98-4239 thru 4251

Date Submitted: 06/19/98
Sampled By: Client
Your Reference:

Sample ID	Results	
	Cyanide, WAD, mg/kg	Moisture, %
LG1 Comp.	<0.05	2.1
LG2-1	0.30	3.5
LG2-2	<0.05	5.3
LG2-3	<0.05	6.0
LG3-1	<0.05	5.4
LG3-2	<0.05	6.1
LG3-3	2.6	4.2
HG6-1	<0.05	3.2
HG6-2	<0.05	3.3
HG7-1	0.52	6.4
HG7-2	0.30	3.1
HG7-3	<0.05	1.4
HG7-4	0.30	3.8

Remarks: Results moisture-corrected to dry weight basis.

Analysis By: Accu-Labs/Eckert
Date: 07/29/98

Approved By:
Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
PA Lab ID #NV004
(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: M^c Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19689
Account No.: MCCLD

Telephone: 356-1300

Fax: 356-8917

Work Authorized By: Gene M^c Clelland
Date Sampled: 06/24/98
Number of Samples: 9
Source: Job 2591
Chemax Control No. 98-4352 thru 4360
Notes:

Date Submitted: 06/25/98
Sampled By: Client
Your Reference:

Sample ID	Results	
	Cyanide, WAD, mg/kg	Moisture, %
HG1-1	0.41	7.0
HG1-2	0.73	7.4
HG2-1	0.49	7.0
HG2-2	0.43	7.5
HG3-1	<0.05	5.8
HG3-2	0.34	5.2
HG4&5-1	0.34	5.7
HG4&5-2	0.32	5.8
HG4&5-3	<0.05	5.5

Remarks: Results moisture-corrected to dry weight basis.

Analysis By: Accu-Labs/Eckert
Date: 07/29/98

Approved By:
Date: 07/29/98

992 Spice Islands Drive, Sparks. Nevada 89431 • P.O. Box 21122, Reno. Nevada 89515

CHEMAX Laboratories, Inc.
Analytical and Environmental Chemists
PA Lab ID #NV004
(702) 355-0202
Fax (702) 355-0817

LABORATORY REPORT

Report To: M^{c} Clelland Laboratories, Inc.
1016 Greg Street
Sparks, NV 89431

Lab Report No.: 19756
Account No.: MCCLD

Telephone: 356-1300 Fax: 356-8917

Work Authorized By: Gene M^{c} Clelland
Date Sampled: 07/06/98
Number of Samples: 2
Source: Job 2591
Chemax Control No. 5-807-020-01 & -02
Notes:

Date Submitted: 07/06/98
Sampled By: Client
Your Reference:

Sample ID	Cyanide, WAD, mg/kg
M-27 Drum Mine Preg Pond	<0.2
M-28 Drum Mine Barren Pond	110

Remarks:

Analysis By: Accu-Labs Date: 07/29/98

Approved By: Date: 07/29/98

992 Spice Islands Drive, Sparks, Nevada 89431 • P.O. Box 21122, Reno, Nevada 89515

Laboratory Analysis Report

Sierra Environmental Monitoring, Inc.

MCCLELLAND LABORATORIES
CLAYTON CHAPPELL
1016 GREG STREET
SPARKS NV 89431

Date : 8/07/98
Client : MLI-576
Taken by: CLIENT
Report : 24471
PO# :

Sample	Collected Date	Time	NEUTRALIZATION POT. TONS/1000T	ACID GEN. POTENTIAL TONS/1000T	ACID GEN. S POTEN.SULFIDE TONS/1000T	PH-SATUR PASTE S.U.	SULFUR, TOTAL LECO FURNACE % S	SULFUR, SO4 SULFATE % S
2591 - HG1-1	7/10/98	:	103	2.2	<0.3	8.86	0.07	0.07
2591 - HG1-2	7/10/98	:	277	5.6	<0.3	8.52	0.18	0.18
2591 - HG2-1	7/10/98	:	178	13	<0.3	8.51	0.41	0.41
2591 - HG2-2	7/10/98	:	99	6.3	<0.3	8.76	0.20	0.20
2591 - HG3-1	7/10/98	:	23	8.1	1.3	8.69	0.26	0.22
2591 - HG3-2	7/10/98	:	12	9.1	1.6	8.79	0.29	0.23
2591 - HG4 & 5-1	7/10/98	:	7	4.7	<0.3	8.57	0.15	0.15
2591 - HG4 & 5-2	7/10/98	:	50	7.2	<0.3	8.65	0.23	0.23
2591 - HG4 & 5-3	7/10/98	:	29	13	<0.3	9.07	0.40	0.40
2591 - HG6-1	7/10/98	:	3	1.3	<0.3	8.45	0.04	0.04
2591 - HG6-2	7/10/98	:	7	5.0	<0.3	8.08	0.16	0.16
2591 - HG7-1	7/10/98	:	38	16	<0.3	8.58	0.50	0.50
2591 - HG7-2	7/10/98	:	52	14	<0.3	8.39	0.44	0.44
2591 - HG7-3	7/10/98	:	48	6.9	<0.3	8.84	0.22	0.22
2591 - HG7-4	7/10/98	:	16	28	3.4	8.00	0.90	0.80
2591 - LG2-1	7/10/98	:	10	25	5.0	8.29	0.80	0.64
2591 - LG2-2	7/10/98	:	49	12	<0.3	8.16	0.39	0.39
2591 - LG2-3	7/10/98	:	<1	32	8.4	7.38	1.0	0.76
2591 - LG3-1	7/10/98	:	50	26	10	8.28	0.83	0.51
2591 - LG3-2	7/10/98	:	59	11	<0.3	8.03	0.36	0.36
2591 - LG3-3	7/10/98	:	57	4.1	<0.3	8.50	0.13	0.13
2591 - W1 COMP I	7/10/98	:	332	15	0.3	7.22	0.49	0.48
2591 - W2 COMP I	7/10/98	:	706	2.5	<0.3	8.10	0.08	0.08
2591 - W3 COMP I	7/10/98	:	64	11	<0.3	7.84	0.35	0.35
2591 - W7 COMP I	7/10/98	:	144	60	29	7.28	1.9	1.0
2591 - LG1 COMP	7/10/98	:	90	13	<0.3	8.08	0.42	0.42

Sample	Collected Date	Time	SULFUR, S= SULFIDE % S
2591 - HG1-1	7/10/98	:	<0.01
2591 - HG1-2	7/10/98	:	<0.01
2591 - HG2-1	7/10/98	:	<0.01
2591 - HG2-2	7/10/98	:	<0.01
2591 - HG3-1	7/10/98	:	0.04

Continued on Next Page

Approved By:

William F. Pillsbury
President

1135 Financial Blvd.
Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404

John Kobza, Ph.D.
John C. Seher
Managers

Laboratory Analysis Report

Sierra Environmental Monitoring, Inc.

MCCLELLAND LABORATORIES
CLAYTON CHAPPELL
1016 GREG STREET
SPARKS NV 89431

Date : 8/07/98
Client : MLI-576
Taken by: CLIENT
Report : 24471
PO# :

Sample	Collected Date	Time	SULFUR, S= SULFIDE % S
2591 - HG3-2	7/10/98	:	0.05
2591 - HG4 & 5-1	7/10/98	:	<0.01
591 - HG4 & 5-2	7/10/98	:	<0.01
591 - HG4 & 5-3	7/10/98	:	<0.01
2591 - HG6-1	7/10/98	:	<0.01
2591 - HG6-2	7/10/98	:	<0.01
591 - HG7-1	7/10/98	:	<0.01
591 - HG7-2	7/10/98	:	<0.01
591 - HG7-3	7/10/98	:	<0.01
2591 - HG7-4	7/10/98	:	0.11
2591 - LG2-1	7/10/98	:	0.16
591 - LG2-2	7/10/98	:	<0.01
- LG2-3	7/10/98	:	0.27
591 - LG3-1	7/10/98	:	0.32
2591 - LG3-2	7/10/98	:	<0.01
2591 - LG3-3	7/10/98	:	<0.01
2591 - W1 COMP I	7/10/98	:	0.01
2591 - W2 COMP I	7/10/98	:	<0.01
2591 - W3 COMP I	7/10/98	:	<0.01
2591 - W7 COMP I	7/10/98	:	0.92
2591 - LG1 COMP	7/10/98	:	<0.01

Approved By: _____

William F. Pillsbury
President

1135 Financial Blvd.
Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404

John Kobza, Ph.D.
John C. Seher
Manager

CLIENT: State of Utah Natural Resources c/o Western States Minerals
AAL REF: EV3711
ATTN: Jim Ashton

ANALYSIS PERFORMED BY AAL ENVIRONMENTAL LLC - NV00040

Drum Mine Preg Pond NDEP Profile II analysis

PARAMETER	UNITS			DETECTION LIMIT	METHOD REFERENCE	SAMPLE DATE	ANALYSIS DATE
ALKALINITY, TOTAL	mg/l		369	1.0	APHA2320B	06-03-98	06-05-98
BICARBONATE	mg/l		279	1.0	APHA2320B	06-03-98	06-05-98
CARBONATE	mg/l		90.4	1.0	APHA2320B	06-03-98	06-05-98
HYDROXIDE	mg/l		ND	1.0	APHA2320B	06-03-98	06-05-98
ALUMINUM	mg/l		0.719	0.020	200.7	06-03-98	06-18-98
ANTIMONY	mg/l	<	0.003	0.003	200.8	06-03-98	06-29-98
ARSENIC	mg/l		0.061	0.005	200.8	06-03-98	06-29-98
BARIUM	mg/l		0.069	0.020	200.7	06-03-98	06-18-98
BERYLLIUM	mg/l	<	0.002	0.002	200.7	06-03-98	06-18-98
BISMUTH	mg/l	<	0.020	0.020	200.7	06-03-98	06-18-98
CADMIUM	mg/l	<	0.002	0.002	200.8	06-03-98	06-29-98
CALCIUM	mg/l		16.0	0.50	200.7	06-03-98	06-18-98
CHLORIDE	mg/l		1360	0.20	300.0	06-03-98	06-06-98
CHROMIUM	mg/l	<	0.005	0.005	200.7	06-03-98	06-18-98
COBALT	mg/l		0.046	0.010	200.7	06-03-98	06-29-98
COPPER	mg/l		0.013	0.010	200.7	06-03-98	06-18-98
FLUORIDE	mg/l		1.4	0.20	300.0	06-03-98	06-05-98
GALLIUM	mg/l	<	0.050	0.050	200.8	06-03-98	06-29-98
IRON	mg/l		0.374	0.020	200.7	06-03-98	06-18-98
LEAD	mg/l		0.015	0.007	200.8	06-03-98	06-29-98
LITHIUM	mg/l		0.059	0.010	200.7	06-03-98	06-18-98
MAGNESIUM	mg/l		14.1	0.10	200.7	06-03-98	06-18-98
MANGANESE	mg/l		0.041	0.005	200.7	06-03-98	06-18-98
MERCURY	mg/l	<	0.0005	0.0005	245.1	06-03-98	06-12-98
MOLYBDENUM	mg/l		0.032	0.020	200.8	06-03-98	06-29-98
NICKEL	mg/l	<	0.02	0.020	200.8	06-03-98	06-29-98
NITRATE -N	mg/l		5.9	0.1	300.0	06-03-98	06-05-98
NITRITE -N	mg/l	<	0.1	0.1	300.0	06-03-98	06-05-98
NITRATE + NITRITE -N	mg/l		5.9	0.1	300.0	06-03-98	06-05-98
pH	mg/l		9.27	0.01	150.1	06-03-98	06-05-98
PHOSPHOROUS	mg/l	<	0.05	0.05	HACH (8190)	06-03-98	06-05-98
POTASSIUM	mg/l		7.36	0.10	200.7	06-03-98	06-18-98
SCANDIUM	mg/l	<	0.002	0.002	200.7	06-03-98	06-18-98
SELENIUM	mg/l		0.036	0.005	200.8	06-03-98	06-29-98
SILVER	mg/l	<	0.010	0.010	200.8	06-03-98	06-29-98
SODIUM	mg/l		1110	0.50	200.7	06-03-98	06-18-98
STRONTIUM	mg/l		0.375	0.002	200.7	06-03-98	06-18-98
SULFATE	mg/l		654	0.2	300.0	06-03-98	06-06-98
THALLIUM	mg/l	<	0.001	0.001	200.8	06-03-98	06-29-98
TIN	mg/l	<	0.050	0.050	200.8	06-03-98	06-29-98
TITANIUM	mg/l		0.005	0.005	200.7	06-03-98	06-18-98
TDS	mg/l		3960	10.0	APHA2540C	06-03-98	06-05-98
VANADIUM	mg/l	<	0.020	0.020	200.7	06-03-98	06-18-98
CYANIDE, WAD	mg/l	<	0.025	0.025	APHA4500CN-I+E	06-03-98	06-16-98
ZINC	mg/l	<	0.050	0.050	200.7	06-03-98	06-18-98

HACH method for Total Phosphorous derived from APHA4500P-B+E
As, Sb, Cd, Se, Tl, Mo, Ni, Ag, Sn, Ga, Pb and Co were sub-contracted to GBL(NV025).

CATIONS	50.81
ANIONS	58.21
%DIFFERENCE	6.78

Karl McCrea
Manager - Environmental Services

CLIENT: State of Utah Natural Resources c/o Western States Minerals
AAL REF: EV3711
ATTN: Jim Ashton

ANALYSIS PERFORMED BY AAL ENVIRONMENTAL LLC - NV00040

Drum Mine Barren Pond NDEP Profile II analysis

PARAMETER	UNITS		DETECTION LIMIT	METHOD REFERENCE	SAMPLE DATE	ANALYSIS DATE
ALKALINITY, TOTAL	mg/l	1121	1.0	APHA2320B	06-03-98	06-05-98
BICARBONATE	mg/l	350	1.0	APHA2320B	06-03-98	06-05-98
CARBONATE	mg/l	771	1.0	APHA2320B	06-03-98	06-05-98
HYDROXIDE	mg/l	ND	1.0	APHA2320B	06-03-98	06-05-98
ALUMINUM	mg/l	0.629	0.020	200.7	06-03-98	06-18-98
ANTIMONY	mg/l	< 0.003	0.003	200.8	06-03-98	06-29-98
ARSENIC	mg/l	0.034	0.005	200.8	06-03-98	06-29-98
BARIUM	mg/l	< 0.020	0.020	200.7	06-03-98	06-18-98
BERYLLIUM	mg/l	< 0.002	0.002	200.7	06-03-98	06-18-98
BISMUTH	mg/l	< 0.020	0.020	200.7	06-03-98	06-18-98
CADMIUM	mg/l	< 0.002	0.002	200.8	06-03-98	06-29-98
CALCIUM	mg/l	3.62	0.50	200.7	06-03-98	06-18-98
CHLORIDE	mg/l	1350	0.20	300.0	06-03-98	06-06-98
CHROMIUM	mg/l	< 0.005	0.005	200.7	06-03-98	06-18-98
COBALT	mg/l	0.034	0.010	200.7	06-03-98	06-29-98
COPPER	mg/l	0.085	0.010	200.7	06-03-98	06-18-98
FLUORIDE	mg/l	2.5	0.20	300.0	06-03-98	06-05-98
GALLIUM	mg/l	< 0.050	0.050	200.8	06-03-98	06-29-98
IRON	mg/l	0.309	0.020	200.7	06-03-98	06-18-98
LEAD	mg/l	< 0.007	0.007	200.8	06-03-98	06-29-98
LITHIUM	mg/l	0.038	0.010	200.7	06-03-98	06-18-98
MAGNESIUM	mg/l	6.11	0.10	200.7	06-03-98	06-18-98
MANGANESE	mg/l	0.013	0.005	200.7	06-03-98	06-18-98
MERCURY	mg/l	< 0.0005	0.0005	245.1	06-03-98	06-12-98
MOLYBDENUM	mg/l	0.055	0.020	200.8	06-03-98	06-29-98
NICKEL	mg/l	< 0.02	0.020	200.8	06-03-98	06-29-98
NITRATE -N	mg/l	0.3	0.1	300.0	06-03-98	06-05-98
NITRITE -N	mg/l	< 0.1	0.1	300.0	06-03-98	06-05-98
NITRATE + NITRITE -N	mg/l	0.3	0.1	300.0	06-03-98	06-05-98
pH	mg/l	10.23	0.01	150.1	06-03-98	06-05-98
PHOSPHOROUS	mg/l	< 0.05	0.05	HACH (8190)	06-03-98	06-05-98
POTASSIUM	mg/l	15.8	0.10	200.7	06-03-98	06-18-98
SCANDIUM	mg/l	< 0.002	0.002	200.7	06-03-98	06-18-98
SELENIUM	mg/l	0.032	0.005	200.8	06-03-98	06-29-98
SILVER	mg/l	< 0.010	0.010	200.8	06-03-98	06-29-98
SODIUM	mg/l	1330	0.50	200.7	06-03-98	06-18-98
STRONTIUM	mg/l	0.036	0.002	200.7	06-03-98	06-18-98
SULFATE	mg/l	444	0.2	300.0	06-03-98	06-06-98
THALLIUM	mg/l	< 0.001	0.001	200.8	06-03-98	06-29-98
TIN	mg/l	< 0.050	0.050	200.8	06-03-98	06-29-98
TITANIUM	mg/l	< 0.005	0.005	200.7	06-03-98	06-18-98
TDS	mg/l	4520	10.0	APHA2540C	06-03-98	06-05-98
VANADIUM	mg/l	< 0.020	0.020	200.7	06-03-98	06-18-98
CYANIDE, WAD	mg/l	< 0.025	0.025	APHA4500CN-I+E	06-03-98	06-16-98
ZINC	mg/l	< 0.050	0.050	200.7	06-03-98	06-18-98

HACH method for Total Phosphorous derived from APHA4500P-B+E
As, Sb, Cd, Se, Tl, Mo, Ni, Ag, Sn, Ga, Pb and Co were sub-contracted to GBL(NV025).

CATIONS	59.21
ANIONS	65.21
%DIFFERENCE	4.83

Karl McCrea
Manager - Environmental Services

AAL ENVIRONMENTAL LLC

McClelland Laboratories -Summary of Hydraulic Conductivity Testing

Sample	Initial Moisture, %	Final Moisture, %	Initial Dry Density, pcf	Final Dry Density, pcf	Final Porosity	Hydraulic Conductivity, cm/sec
HG4&5-2 Composite	5.1	10.4	82.0	103.3	0.335	5.5×10^{-2}
HG4&5-2 Composite	5.1	7.7	82.2	97.8	0.353	1.1×10^{-1}
HG4&5-3 Composite	4.4	7.6	81.3	98.8	0.361	1.6×10^{-1}
HG6-1	2.6	11.9	85.6	98.0	0.365	9.0×10^{-2}
HG3-2 Composite	3.3	8.1	84.1	96.9	0.374	9.5×10^{-2}
HG3-1	6.3	9.6	78.0	96.3	0.368	1.8×10^{-2}
HG6-2 Composite	3.1	14.4	87.6	113.9	0.266	8.0×10^{-2}
HG7-1 Composite III	4.5	7.1	89.8	102.8	0.332	7.8×10^{-2}
HG7-2 Composite	4.2	12.7	89.9	111.9	0.226	6.3×10^{-2}
HG7-3 Composite	1.8	11.2	90.0	109.5	0.309	1.6×10^{-1}
HG7-4 Composite III	4.4	13.6	85.0	107.2	0.280	2.0×10^{-2}
LG1 Composite	2.7	12.8	86.5	106.3	0.301	1.5×10^{-1}

Sample	Initial Moisture, %	Final Moisture, %	Initial Dry Density, pcf	Final Dry Density, pcf	Final Porosity	Hydraulic Conductivity, cm/sec
LG2-1 Composite	1.5	11.4	86.0	104.0	0.320	1.5×10^{-1}
LG2-2 Composite	2.7	13.0	87.4	109.3	0.234	2.2×10^{-2}
LG2-3 Composite	5.8	16.1	78.2	87.2	0.419	5.1×10^{-2}
LG3-1 Composite	5.7	12.3	78.8	86.9	0.410	1.7×10^{-1}
LG3-2 Composite	7.0	14.4	79.7	104.5	0.310	1.1×10^{-2}
LG3-3 Composite	4.9	12.1	82.8	104.5	0.310	1.3×10^{-1}
HG1-1 Composite 3	8.3	14.2	77.7	113.0	0.258	1.1×10^{-2}
HG1-2 Composite 3	7.3	14.1	78.0	108.3	0.305	1.5×10^{-1}
HG2-1 Composite 3	6.0	15.4	75.9	110.8	0.290	7.1×10^{-5}
HG2-2 Composite 3	6.7	13.8	73.0	111.4	0.278	7.4×10^{-5}

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McClelland Laboratories -Summary of Drained Down Moisture Contnet

Sample	Final Moisture, gravimetric,%	Final Dry Density, pcf	Final Void Ratio	Final Porosity	Final Saturation, %	Final Moisture, volumetric
HG4&5-2 Composite	10.4	103.3	0.503	0.335	51	0.172
HG4&5-1 Composite	7.7	97.8	0.546	0.353	34	0.121
HG4&5-3 Composite	7.6	98.8	0.566	0.361	33	0.120
HG6-1	11.9	98.0	0.575	0.365	51	0.187
HG3-2 Composite	8.1	96.9	0.605	0.374	33	0.126
HG3-1	9.6	96.3	0.581	0.368	40	0.148
HG6-2 Composite	14.4	113.9	0.362	0.266	99	0.262
HG7-1 Composite III	7.1	102.8	0.496	0.332	35	0.117
HG7-2 Composite	12.7	111.9	0.292	0.226	100	0.227
HG7-3 Composite	11.2	109.5	0.448	0.309	64	0.197
HG7-4 Composite III	13.6	107.2	0.388	0.280	84	0.234
LG1 Composite	12.8	106.3	0.430	0.301	73	0.218

Sample	Final Moisture, gravimetric,%	Final Dry Density, pcf	Final Void Ratio	Final Porosity	Final Saturation, %	Final Moisture, volumetric
LG2-1 Composite	11.4	104.0	0.470	0.320	59	0.190
LG2-2 Composite	13.0	109.3	0.306	0.234	97	0.228
LG2-3 Composite	16.1	87.2	0.722	0.419	54	0.225
LG3-1 Composite	12.3	86.9	0.695	0.410	42	0.171
LG3-2 Composite	14.4	104.5	0.449	0.310	78	0.241
LG3-3 Composite	12.1	104.5	0.449	0.310	65	0.203
HG1-1 Composite III	14.2	113.0	0.347	0.258	100	0.257
HG1-2 Composite III	14.1	108.3	0.439	0.305	80	0.245
HG2-1 Composite III	15.4	110.8	0.409	0.290	94	0.273
HG2-2 Composite III	13.8	111.4	0.384	0.278	89	0.246

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Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98010998
Identification: 1
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.2	Normal	
Salinity - ECe mmhos/cm	0.4		
Phosphorus - P ppm	2.2		50-70 lbs P2O5/A
Potassium - K ppm	174		0 lbs K2O/A
Nitrate-Nitrogen - N ppm	2.8		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	3.0	Soil Not Sodic	
Organic Matter %	0.76		

Notes
CEC = 16.2 meq/100 g
Manure is fine - the only problem might be high salts if lots of manure used.

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98010999
Identification: 2
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.0	Normal	
Salinity - ECe mmhos/cm	0.4		
Phosphorus - P ppm	1.0		50-70 lbs P2O5/A
Potassium - K ppm	80		80-120 lbs K2O/A
Nitrate-Nitrogen - N ppm	1.5		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	0.69	Soil Not Sodic	
Organic Matter %	0.68		

Notes
CEC = 13.8 meq/100 g

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011000
Identification: 3
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.7	Very High	
Salinity - ECe mmhos/cm	0.7		
Phosphorus - P ppm	2.5		50-70 lbs P2O5/A
Potassium - K ppm	97		80-120 lbs K2O/A
Nitrate-Nitrogen - N ppm	1.5		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	15.0	Soil Is Sodic	
Organic Matter %	0.51		

Notes
CEC = 19.5 meq/100 g
Soil is sodic.

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011001
Identification: 4
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.4	Normal	
Salinity - ECe mmhos/cm	5.6		
Phosphorus - P ppm	1.3		50-70 lbs P2O5/A
Potassium - K ppm	81		80-120 lbs K2O/A
Nitrate-Nitrogen - N ppm	9.3		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	24	Soil Is Sodic	
Organic Matter %	0.43		

Notes
CEC = 12.3 meq/100 g
Soil is sodic.

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011002
Identification: 5
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.1	Normal	
Salinity - ECe mmhos/cm	0.3		
Phosphorus - P ppm	1.9		50-70 lbs P2O5/A
Potassium - K ppm	179		0 lbs K2O/A
Nitrate-Nitrogen - N ppm	1.5		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	2.36	Soil Not Sodic	
Organic Matter %	0.83		

Notes
CEC = 15.9 meq/100 g

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011003
Identification: 6
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results			Interpretations	Recommendations
Texture		Loamy Sand		
Lime		++	Normal	
pH		7.9	Normal	
Salinity - ECe	mmhos/cm	4.6		
Phosphorus - P	ppm	1.6		50-70 lbs P2O5/A
Potassium - K	ppm	46		140-180 lbs K2O/A
Nitrate-Nitrogen - N	ppm	1.3		40-70 lbs N/A
Zinc - Zn	ppm			
Iron - Fe	ppm			
Copper - Cu	ppm			
Manganese - Mn	ppm			
Sulfate-Sulfur - S	ppm			
SAR		7.58	Soil Not Sodic	
Organic Matter	%	0.31		

Notes
CEC = 30.1 meq/100 g

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011004
Identification: 7
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Loamy Sand		
Lime	++	Normal	
pH	8.5	High	
Salinity - ECe mmhos/cm	1.4		
Phosphorus - P ppm	1.6		50-70 lbs P2O5/A
Potassium - K ppm	111		0 lbs K2O/A
Nitrate-Nitrogen - N ppm	5.2		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	15.0	Soil Is Sodic	
Organic Matter %	0.58		

Notes
CEC = 21.0 meq/100 g
Soil is sodic.

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011005
Identification: 8
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.0	Normal	
Salinity - ECe mmhos/cm	20.0		
Phosphorus - P ppm	3.2		50-70 lbs P2O5/A
Potassium - K ppm	57		140-180 lbs K2O/A
Nitrate-Nitrogen - N ppm	6.0		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	36.0	Soil Is Sodic	
Organic Matter %	0.49		

Notes
CEC = 9.3 meq/100 g
Soil is sodic.

For further assistance, please see your County Agent --

Soil Test Report
and
Fertilizer Recommendations

USU Analytical Labs
Utah State University
Logan, Utah 84322-4830
(435) 797-2217
(435) 797-2117 (FAX)

Date Received: 5/19/98
Date Completed: 6/2/98

Name: Jim Ashton
Address: Western States Minerals
250 South Rock Blvd Suite 130
Reno NV 89502

County:

Lab Number: 98011006
Identification: 9
Crop to be Grown: Reclamation

Grower's Comments:

Acres in Field:

Soil Test Results		Interpretations	Recommendations
Texture	Sandy Loam		
Lime	++	Normal	
pH	8.1	Normal	
Salinity - ECe mmhos/cm	1.4		
Phosphorus - P ppm	2.4		50-70 lbs P2O5/A
Potassium - K ppm	218		0 lbs K2O/A
Nitrate-Nitrogen - N ppm	24.2		40-70 lbs N/A
Zinc - Zn ppm			
Iron - Fe ppm			
Copper - Cu ppm			
Manganese - Mn ppm			
Sulfate-Sulfur - S ppm			
SAR	2.78	Soil Not Sodic	
Organic Matter %	0.51		

Notes
CEC = 9.3 meq/100 g

For further assistance, please see your County Agent --

APPENDIX C

Hydrologic Evaluation Results

TABLE C-1
DRUM MINE RECLAMATION AND CLOSURE
RESULTS SUMMARY OF HYDROLOGIC EVALUATION
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

SUMMARY TABLE - TEN YEAR PERIOD
(inches)

ITEM DESCRIPTION	LG1	LG1 AND TOPSOIL	LG2	LG2 AND TOPSOIL	LG3	LG3 AND TOPSOIL	HG1	HG1 AND TOPSOIL	HG2	HG2 AND TOPSOIL	HG3	HG3 AND TOPSOIL	HG4&5	HG4&5 AND TOPSOIL	HG6	HG6 AND TOPSOIL	HG7	HG7 AND TOPSOIL
HEAP PARAMETERS:																		
Average Thickness (ft)	20	20	35	35	35	35	25	25	20	20	35	35	45	45	30	30	25	25
Field Capacity (vol/vol)	0.218	0.218	0.214	0.214	0.205	0.205	0.251	0.251	0.26	0.26	0.137	0.137	0.108	0.108	0.224	0.224	0.194	0.194
Sat. Hyd. Cond. (cm/sec)	0.15	0.15	0.074	0.074	0.1	0.1	0.013	0.013	7E-05	7E-05	0.056	0.056	0.138	0.138	0.085	0.085	0.08	0.08
Horizontal Area (acres)	3.5	3.5	7.1	7.1	5.4	5.4	6.9	6.9	7.3	7.3	6.5	6.5	12.7	12.7	2.3	2.3	7.4	7.4
TOPSOIL PARAMETERS:																		
Average Thickness (in)	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Field Capacity (vol/vol)	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Sat. Hyd. Cond. (cm/sec)	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007
HELP RESULTS:																		
Average Precipitation	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07	10.07
Average Runoff	0.014	0.114	0.014	0.115	0.015	0.117	0.017	0.116	0.019	0.117	0.016	0.117	0.016	0.117	0.013	0.118	0.015	0.116
Average Evapotranspiration	7.02	8.76	7.85	9.06	8.25	9.26	6.708	8.523	9.554	9.691	9.47	9.64	9.62	9.75	7.49	8.97	7.5	8.91
Average Percolation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Initial Water Storage - Heap	11.592	11.592	34.56	34.56	40.18	40.18	51.336	51.336	28.476	28.476	31.97	31.97	33.67	33.67	18.23	18.23	20.28	20.28
Final Water Storage - Heap	41.2	22.3	55.43	41.81	56.9	45.23	82.904	63.26	31.872	29.309	36.71	33.47	37.06	34.56	43.05	26.7	44.81	29.2
Final Water Storage - Heap (vol/vol)	0.172	0.093	0.132	0.1	0.136	0.108	0.23	0.176	0.133	0.122	0.087	0.08	0.069	0.064	0.12	0.074	0.149	0.097
Initial Water Storage - Topsoil		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6		0.6
Final Water Storage - Topsoil		1.1		1.11		1.11		1.104		0.805		1.12		0.81		1.11		1.11
Final Water Storage - Topsoil (vol/vol)		0.184		0.185		0.185		0.184		0.134		0.187		0.135		0.185		0.185

TABLE C-2
DRUM MINE RECLAMATION AND CLOSURE
LOW GRADE #1 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	20
porosity (vol/vol)	0.301
Field Capacity (vol/vol)	0.218
Wilting Point (vol/vol)	0.046
Initial Water (vol/vol)	0.046
Sat. Hyd. Cond. (cm/sec)	0.15
SCS Curve Number (Waste)	77.3
Horizontal Area (acres)	3.5

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.061	0	0.068	0	0	0	0	0.005	0.002	0	0.014
Evapotranspiration	7.252	5.763	6.954	8.53	9.424	7.882	7.93	6.338	5.618	4.454	7.015
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	3.247	2.037	4.479	3.2	3.588	3.628	3.23	2.698	1.929	2.346	3.038
Heap Water at Start of Year	11.592	14.839	16.876	21.354	24.554	28.141	31.306	34.998	37.456	39.625	
Heap Water at End of Year	14.839	16.876	21.354	24.554	28.141	31.306	34.998	37.456	39.625	41.786	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 41.2338 inches 0.1718 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

LOW GRADE #1 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	20
porosity (vol/vol)	0.301
Field Capacity (vol/vol)	0.218
Wilting Point (vol/vol)	0.046
Initial Water (vol/vol)	0.046
Sat. Hyd. Cond. (cm/sec)	0.15
SCS Curve Number (Soil)	90.8
Horizontal Area (acres)	3.5

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.355	0.051	0.044	0.093	0.033	0.087	0.152	0.005	0.114
Evapotranspiration	8.524	7.528	8.45	10.116	11.45	10.032	10.772	8.015	7.533	5.198	8.762
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.74	0.246	2.695	1.563	1.516	1.386	0.355	0.938	-0.135	1.597	1.19
Heap Water at Start of Year	12.192	13.932	14.178	16.873	18.436	19.952	20.876	21.693	22.391	22.496	
Heap Water at End of Year	13.932	14.178	16.873	18.436	19.952	20.876	21.693	22.391	22.496	23.907	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 22.2508 inches 0.0927 vol/vol In Topsoil 1.1045 inches 0.1841 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-3
DRUM MINE RECLAMATION AND CLOSURE
LOW GRADE #2 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	35
porosity (vol/vol)	0.324
Field Capacity (vol/vol)	0.214
Wilting Point (vol/vol)	0.08
Initial Water (vol/vol)	0.08
Sat. Hyd. Cond. (cm/sec)	0.074
SCS Curve Number (Waste)	77.3
Horizontal Area (acres)	7.1

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.58	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.068	0	0.068	0	0	0	0	0.005	0.002	0	0.014
Evapotranspiration	7.814	6.285	7.791	9.001	10.692	8.7	9.485	7.546	6.427	4.757	7.85
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	2.678	1.515	3.641	2.729	2.318	2.81	1.675	1.489	1.121	2.043	2.202
Heap Water at Start of Year	34.56	37.238	38.753	42.394	45.122	47.44	49.789	51.926	53.175	54.535	
Heap Water at End of Year	37.238	38.753	42.394	45.122	47.44	49.789	51.926	53.175	54.535	56.393	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 55.4334 inches 0.132 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

LOW GRADE #2 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	35
porosity (vol/vol)	0.324
Field Capacity (vol/vol)	0.214
Wilting Point (vol/vol)	0.08
Initial Water (vol/vol)	0.08
Sat. Hyd. Cond. (cm/sec)	0.074
SCS Curve Number (Soil)	90.8
Horizontal Area (acres)	7.1

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.58	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.36	0.05	0.044	0.093	0.033	0.087	0.157	0.005	0.115
Evapotranspiration	8.625	7.602	8.883	10.567	11.804	10.438	10.995	8.915	7.647	5.12	9.06
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.639	0.17	2.256	1.113	1.162	0.979	0.132	0.038	-0.254	1.675	0.891
Heap Water at Start of Year	35.16	36.799	36.968	39.225	40.338	41.499	42.017	42.611	42.41	42.395	
Heap Water at End of Year	36.799	36.968	39.225	40.338	41.499	42.017	42.611	42.41	42.395	43.885	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 41.8139 inches 0.0996 vol/vol In Topsoil 1.1109 inches 0.1852 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-4
DRUM MINE RECLAMATION AND CLOSURE
LOW GRADE #3 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	35
porosity (vol/vol)	0.343
Field Capacity (vol/vol)	0.205
Wilting Point (vol/vol)	0.093
Initial Water (vol/vol)	0.093
Sat. Hyd. Cond. (cm/sec)	0.1
SCS Curve Number (Waste)	77.7
Horizontal Area (acres)	5.4

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.073	0	0.068	0	0	0	0	0.005	0.002	0	0.015
Evapotranspiration	8.523	6.837	8.094	9.492	11.409	9.12	10.096	7.54	6.725	4.849	8.249
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.964	1.163	3.338	2.238	1.601	2.39	1.064	1.495	0.823	1.951	1.803
Heap Water at Start of Year	40.176	42.14	43.303	46.641	48.879	50.48	52.408	53.934	55.189	56.252	
Heap Water at End of Year	42.14	43.303	46.641	48.879	50.48	52.408	53.934	55.189	56.252	58.018	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 56.9016 inches 0.1355 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

LOW GRADE #3 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	35
porosity (vol/vol)	0.343
Field Capacity (vol/vol)	0.205
Wilting Point (vol/vol)	0.093
Initial Water (vol/vol)	0.093
Sat. Hyd. Cond. (cm/sec)	0.1
SCS Curve Number (Soil)	90.9
Horizontal Area (acres)	5.4

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.029	0.362	0.053	0.044	0.096	0.034	0.087	0.157	0.006	0.117
Evapotranspiration	9.467	7.724	9.063	10.851	12.027	10.575	11.105	8.9	7.758	5.157	9.263
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	0.797	0.047	2.074	0.826	0.939	0.839	0.02	0.053	-0.365	1.638	0.687
Heap Water at Start of Year	40.776	41.573	41.619	43.694	44.519	45.458	45.836	46.318	46.132	46.006	
Heap Water at End of Year	41.573	41.619	43.694	44.519	45.458	45.836	46.318	46.132	46.006	47.459	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 45.233 inches 0.1077 vol/vol In Topsoil 1.1096 inches 0.185 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-5
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #1 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	25
porosity (vol/vol)	0.282
Field Capacity (vol/vol)	0.251
Wilting Point (vol/vol)	0.138
Initial Water (vol/vol)	0.138
Sat. Hyd. Cond. (cm/sec)	0.013
SCS Curve Number (Waste)	77.7
Horizontal Area (acres)	6.9

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.092	0	0.07	0	0	0	0	0.006	0.004	0	0.017
Evapotranspiration	6.818	5.332	6.969	7.971	9.037	7.259	8.208	5.852	5.339	4.294	6.708
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	3.65	2.468	4.461	3.759	3.973	4.251	2.952	3.182	2.207	2.506	3.341
Heap Water at Start of Year	51.336	54.986	57.454	61.915	65.674	69.647	73.436	76.85	79.792	82.239	
Heap Water at End of Year	54.986	57.454	61.915	65.674	69.647	73.436	76.85	79.792	82.239	84.56	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 82.904 inches 0.2303 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #1 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	25
porosity (vol/vol)	0.282
Field Capacity (vol/vol)	0.251
Wilting Point (vol/vol)	0.138
Initial Water (vol/vol)	0.138
Sat. Hyd. Cond. (cm/sec)	0.013
SCS Curve Number (Soil)	90.9
Horizontal Area (acres)	6.9

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.36	0.052	0.044	0.097	0.035	0.087	0.157	0.006	0.116
Evapotranspiration	8.217	7.139	8.494	9.848	10.828	9.748	10.786	8.027	7.158	4.982	8.523
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	2.047	0.633	2.646	1.83	2.137	1.665	0.339	0.926	0.236	1.812	1.427
Heap Water at Start of Year	51.936	53.983	54.616	57.262	59.091	61.229	62.432	63.233	63.92	64.396	
Heap Water at End of Year	53.983	54.616	57.262	59.091	61.229	62.432	63.233	63.92	64.396	66.023	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 63.262 inches 0.176 vol/vol In Topsoil 1.104 inches 0.184 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-6
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #2 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	20
porosity (vol/vol)	0.284
Field Capacity (vol/vol)	0.26
Wilting Point (vol/vol)	0.113
Initial Water (vol/vol)	0.113
Sat. Hyd. Cond. (cm/sec)	0.000073
SCS Curve Number (Waste)	77.7
Horizontal Area (acres)	7.3

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.101	0	0.07	0	0	0	0	0.008	0.006	0	0.019
Evapotranspiration	9.833	8.027	9.513	11.287	12.465	10.951	11.559	8.558	7.96	5.383	9.554
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	0.626	-0.227	1.916	0.443	0.545	0.559	-0.399	4.74	-0.416	1.417	0.494
Heap Water at Start of Year	28.476	29.102	28.874	30.791	31.234	31.778	31.875	31.938	32.172	31.996	
Heap Water at End of Year	29.102	28.874	30.791	31.234	31.778	31.875	31.938	32.172	31.996	33.228	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 31.872 inches 0.133 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #2 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	20
porosity (vol/vol)	0.284
Field Capacity (vol/vol)	0.26
Wilting Point (vol/vol)	0.113
Initial Water (vol/vol)	0.113
Sat. Hyd. Cond. (cm/sec)	0.000073
SCS Curve Number (Soil)	90.9
Horizontal Area (acres)	7.3

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.363	0.05	0.045	0.096	0.037	0.091	0.156	0.004	0.117
Evapotranspiration	9.15	8.218	9.545	11.738	12.504	10.919	11.509	9.029	8.012	6.289	9.691
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.114	-0.446	1.592	-0.057	0.46	0.495	-0.386	-0.081	-0.619	0.506	0.258
Heap Water at Start of Year	29.076	30.19	29.744	31.336	31.279	31.739	31.772	31.848	31.528	31.149	
Heap Water at End of Year	30.19	29.744	31.336	31.279	31.739	31.772	31.848	31.528	31.149	31.47	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 29.309 inches 0.1221 vol/vol In Topsoil 0.8046 inches 0.134 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-7
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #3 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	35
porosity (vol/vol)	0.371
Field Capacity (vol/vol)	0.137
Wilting Point (vol/vol)	0.074
Initial Water (vol/vol)	0.074
Sat. Hyd. Cond. (cm/sec)	0.056
SCS Curve Number (Waste)	77.7
Horizontal Area (acres)	6.5

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.075	0	0.074	0	0	0	0	0.008	0.004	0	0.016
Evapotranspiration	9.628	7.835	9.359	10.964	12.341	11.138	10.93	9.17	7.868	5.45	9.468
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	0.856	-0.035	2.067	0.766	0.669	0.374	0.23	-0.138	-0.323	1.35	0.582
Heap Water at Start of Year	31.968	32.824	32.789	34.856	35.622	36.291	36.203	36.895	36.518	36.434	
Heap Water at End of Year	32.824	32.789	34.856	35.622	36.291	36.203	36.895	36.518	36.434	37.6	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 36.7115 inches 0.0874 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #3 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	35
porosity (vol/vol)	0.371
Field Capacity (vol/vol)	0.137
Wilting Point (vol/vol)	0.074
Initial Water (vol/vol)	0.074
Sat. Hyd. Cond. (cm/sec)	0.056
SCS Curve Number (Soil)	90.9
Horizontal Area (acres)	6.5

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.03	0.363	0.058	0.046	0.098	0.034	0.087	0.156	0.006	0.117
Evapotranspiration	9.196	8.25	9.548	11.704	12.585	10.965	11.819	8.619	8.14	5.559	9.639
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.069	-0.48	1.588	-0.032	0.378	0.447	-0.693	0.333	-0.748	1.236	0.31
Heap Water at Start of Year	32.568	33.637	33.157	34.745	34.713	35.092	35.077	34.848	34.94	34.433	
Heap Water at End of Year	33.637	33.157	34.745	34.713	35.092	35.077	34.848	34.94	34.433	35.484	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 33.4713 inches 0.0797 vol/vol In Topsoil 1.1243 inches 0.1874 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-8
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #4&5 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	45
porosity (vol/vol)	0.349
Field Capacity (vol/vol)	0.108
Wilting Point (vol/vol)	0.061
Initial Water (vol/vol)	0.061
Sat. Hyd. Cond. (cm/sec)	0.138
SCS Curve Number (Waste)	77.3
Horizontal Area (acres)	12.7

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.079	0	0.071	0	0	0	0	0.009	0.005	0	0.016
Evapotranspiration	9.408	7.498	10.319	11.16	12.668	10.67	11.459	8.969	7.642	6.398	9.619
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.073	0.302	1.111	0.57	0.342	0.84	-0.299	0.062	-0.096	0.402	0.431
Heap Water at Start of Year	33.672	34.745	35.047	36.158	36.728	37.069	37.447	37.81	37.433	37.576	
Heap Water at End of Year	34.745	35.047	36.158	36.728	37.069	37.447	37.81	37.433	37.576	37.793	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 37.0606 inches 0.0686 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #4&5 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	45
porosity (vol/vol)	0.349
Field Capacity (vol/vol)	0.108
Wilting Point (vol/vol)	0.061
Initial Water (vol/vol)	0.061
Sat. Hyd. Cond. (cm/sec)	0.138
SCS Curve Number (Soil)	90.8
Horizontal Area (acres)	12.7

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.297	0.031	0.369	0.05	0.044	0.091	0.039	0.087	0.158	0.006	0.117
Evapotranspiration	9.551	7.182	10.495	11.79	12.569	11.095	11.765	8.771	7.842	6.418	9.748
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	0.712	0.587	0.636	-0.109	0.397	0.323	-0.643	0.181	-0.45	0.376	0.201
Heap Water at Start of Year	34.272	34.984	35.571	36.207	36.098	36.496	36.357	36.176	36.118	35.907	
Heap Water at End of Year	34.984	35.571	36.207	36.098	36.496	36.357	36.176	36.118	35.907	36.098	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 34.5579 inches 0.064 vol/vol In Topsoil 0.8083 inches 0.1347 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-9
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #6 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	30
porosity (vol/vol)	0.316
Field Capacity (vol/vol)	0.224
Wilting Point (vol/vol)	0.049
Initial Water (vol/vol)	0.049
Sat. Hyd. Cond. (cm/sec)	0.085
SCS Curve Number (Waste)	78.2
Horizontal Area (acres)	2.3

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.06	0	0.068	0	0	0	0	0.005	0.002	0	0.013
Evapotranspiration	7.902	5.988	7.496	8.901	9.864	8.193	9.034	6.883	6.027	4.64	7.493
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	2.598	1.812	3.936	2.829	3.146	3.317	2.129	2.153	1.521	2.16	2.56
Heap Water at Start of Year	18.228	20.826	22.638	26.575	29.403	32.55	35.405	37.993	39.906	41.667	
Heap Water at End of Year	20.826	22.638	26.575	29.403	32.55	35.405	37.993	39.906	41.667	43.641	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	
Final Water Storage at End of Year 10 in Heap		43.053 inches		0.1196 vol/vol							

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #6 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	30
porosity (vol/vol)	0.316
Field Capacity (vol/vol)	0.224
Wilting Point (vol/vol)	0.049
Initial Water (vol/vol)	0.049
Sat. Hyd. Cond. (cm/sec)	0.085
SCS Curve Number (Soil)	91.1
Horizontal Area (acres)	2.3

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.56	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.361	0.059	0.046	0.104	0.035	0.087	0.157	0.006	0.118
Evapotranspiration	8.614	7.569	8.847	10.36	11.684	10.401	11.161	8.307	7.597	5.185	8.973
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.65	0.202	2.292	1.311	1.281	1.005	-0.037	0.648	-0.204	1.609	0.975
Heap Water at Start of Year	18.828	20.478	20.68	22.972	24.283	25.564	26.107	26.532	26.938	26.973	
Heap Water at End of Year	20.478	20.68	22.972	24.283	25.564	26.107	26.532	26.938	26.973	28.397	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	
Final Water Storage at End of Year 10 in Heap		26.7004 inches		0.0742 vol/vol		In Topsoil	1.1088 inches		0.1848 vol/vol		

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-10
DRUM MINE RECLAMATION AND CLOSURE
HIGH GRADE #7 WITHOUT TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness (ft)	25
porosity (vol/vol)	0.287
Field Capacity (vol/vol)	0.194
Wilting Point (vol/vol)	0.065
Initial Water (vol/vol)	0.065
Sat. Hyd. Cond. (cm/sec)	0.08
SCS Curve Number (Waste)	77.7
Horizontal Area (acres)	7.4

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.58	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.076	0	0.069	0	0	0	0	0.005	0.002	0	0.015
Evapotranspiration	7.745	6.009	7.296	8.829	10.345	8.106	9.081	8.772	6.179	4.651	7.501
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	2.739	1.791	4.135	2.901	2.665	3.404	2.079	2.263	1.368	2.149	2.549
Heap Water at Start of Year	20.28	23.019	24.81	28.945	31.846	34.511	37.453	39.994	42.017	43.625	
Heap Water at End of Year	23.019	24.81	28.945	31.846	34.511	37.453	39.994	42.017	43.625	45.588	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 44.8082 inches 0.1494 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor

HIGH GRADE #7 WITH TOPSOIL HYDROLOGIC EVLAUATION RESULTS
METHOD: HELP MODEL VERSION 3.05a (5 JUNE 1996)

HEAP PARAMETERS:

Average Thickness Heap (ft)	25
porosity (vol/vol)	0.287
Field Capacity (vol/vol)	0.194
Wilting Point (vol/vol)	0.065
Initial Water (vol/vol)	0.065
Sat. Hyd. Cond. (cm/sec)	0.08
SCS Curve Number (Soil)	90.9
Horizontal Area (acres)	7.4

DESCRIPTION	YR-1 inches	YR-2 inches	YR-3 inches	YR-4 inches	YR-5 inches	YR-6 inches	YR-7 inches	YR-8 inches	YR-9 inches	YR-10 inches	AVERAGE inches
Precipitation	10.58	7.8	11.5	11.73	13.01	11.51	11.16	9.04	7.55	6.8	10.07
Runoff	0.296	0.028	0.36	0.052	0.044	0.097	0.033	0.087	0.152	0.006	0.116
Evapotranspiration	8.571	7.519	8.832	10.453	11.482	10.293	11.153	8.032	7.605	5.169	8.911
Percolation	0	0	0	0	0	0	0	0	0	0	0
Average Head on Liner	0	0	0	0	0	0	0	0	0	0	0
Change in Water Storage	1.693	0.253	2.308	1.225	1.483	1.12	-0.027	0.921	-0.206	1.625	1.04
Heap Water at Start of Year	20.88	22.573	22.826	25.133	26.358	27.842	28.5	28.935	29.617	29.65	
Heap Water at End of Year	22.573	22.826	25.133	26.358	27.842	28.5	28.935	29.617	29.65	31.09	
Snow Water at Start of Year	0	0	0	0	0	0	0.462	0	0.239	0	
Snow Water at End of Year	0	0	0	0	0	0.462	0	0.239	0	0.185	

Final Water Storage at End of Year 10 in Heap 29.2014 inches 0.0973 vol/vol In Topsoil 1.1087 inches 0.1848 vol/vol

EVALUATION CONSTANTS AND ASSUMPTIONS:

HDPE Liner Thickness (in)	0.06	
HDPE Pinhole Density (holes/acre)	2	
Installation Defects (holes/acre)	1	
Placement Quality	4	Poor
Topsoil Texture	Sandy Loam	
Topsoil Thickness (in)	6	
Topsoil Porosity (vol/vol)	0.453	
TS Field Capacity (vol/vol)	0.19	
TS Wilting Point (vol/vol)	0.085	
TS Initial Water (vol/vol)	0.1	
TS Sat. Hyd. Cond. (cm/sec)	0.00072	

TABLE C-11
DRUM MINE RECLAMATION AND CLOSURE
HYDROLOGIC EVALUATION - WEATHER DATA

EVAPOTRANSPIRATION DATA - OBTAINED FROM DELTA, UTAH

Station Latitude (degrees)	39.38
Maximum Leaf Area Index	1
Start of Growing Season (Julian)	126
End of Growing Season (Julian)	282
Evaporative Zone Depth (in)	18
Average Annual Wind Speed (mph)	10.1
Avg. 1st QTR Relative Humidity (%)	62
Avg. 2nd QTR Relative Humidity (%)	36
Avg. 3rd QTR Relative Humidity (%)	34
Avg. 4th QTR Relative Humidity (%)	56

PRECIPITATION DATA - OBTAINED FROM DELTA, UTAH (Station 422090, Years 1978 - 1987)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1978	1.56	1.02	1.38	0.91	0.52	0.03	0.06	0.95	1.78	0.25	2	0.1	10.56
1979	0.72	1.13	1.81	0.53	1.09	0.08	0.55	0.1	0.01	1.25	0.4	0.13	7.8
1980	1.12	1.62	2.79	0.32	2.95	0.02	0.13	0.05	0.91	0.75	0.74	0.1	11.5
1981	0.24	0.2	0.83	1.41	2.88	0.35	0.42	0.21	1.23	2.49	1.09	0.58	11.73
1982	0.57	0.17	0.72	0.01	0.7	0.04	1.63	1.73	4.18	1.85	0.35	1.06	13.01
1983	0.49	0.62	1.57	1.35	0.68	0.33	0.34	1.02	1.38	0.63	1.61	1.49	11.51
1984	0.68	0.28	0.9	1.12	0.37	1.75	2.04	1.48	0.44	1.05	0.33	0.72	11.16
1985	0.51	0.39	0.71	0.17	1.25	0.61	1.05	0.08	1.04	1.17	1.14	0.92	9.04
1986	0.39	0.56	1.42	1.35	0.7	0.1	0.23	0.78	1.38	0.34	0.26	0.04	7.55
1987	0.38	0.77	1	0.06	0.52	0.09	0.81	0.52	0.24	1.07	0.76	0.58	6.8
AVERAGE	0.666	0.676	1.293	0.723	1.166	0.34	0.726	0.692	1.259	1.085	0.868	0.572	

TEMPERATURE DATA - SYNTHETICALLY GENERATED USING PRECIPITATION DATA AND COEFFICIENTS FOR DELTA, UTAH

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Normal Mean Monthly Temperature	25.5	32.2	40.3	48.6	57.8	67.1	75.5	73.6	63.6	51.3	37.1	28

SOLAR RADIATION DATA - SYNTHETICALLY GENERATED USING PRECIPITATION DATA AND COEFFICIENTS FOR MILFORD, UTAH AND STATION LATITUDE = 39.38 DEGREES

APPENDIX D

Settlement and Reclamation Agreement

SETTLEMENT AND RECLAMATION AGREEMENT

BETWEEN AND AMONG

WESTERN STATES MINERALS CORPORATION

AND

THE UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF LAND MANAGEMENT

and STATE OF UTAH, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF OIL, GAS AND MINING and DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY

TABLE OF CONTENTS

This Settlement and Reclamation Agreement (the "Agreement") is entered into between and among WESTERN STATES MINERALS CORPORATION ("Western") on the one hand and the UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT ("BLM"), and THE STATE OF UTAH, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF OIL, GAS AND MINING ("DOGM") and DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY ("DWQ") (BLM, DOGM AND DWQ are each individually referred to as an "Agency," and are collectively referred to herein as the "Agencies") on the other.

RECITALS

The Utah State Director of the BLM has issued a Decision dated October 20, 1997, affirming a decision dated July 14, 1997, issued by the BLM Area Manager, and ordering, *inter alia*, that Western submit a plan of operations to reclaim specified portions of the Drum mine site in Millard County, Utah.

DOGM has commenced formal adjudicatory proceedings (Docket No. 97-009, Cause No. M/027/007) to obtain, *inter alia*, reclamation by Western of the specified portions of the site.

DWQ wishes to review and comment upon proposed reclamation plans for the Drum mine site in order to reduce the possibility that there could be any significant long-term discharge of contaminants to the subsurface from the specified portions of the site.

Western has committed to comply with the decision of the BLM State Director by submitting a plan of operations and reclaiming the specified portions of the Drum site in the manner required by the BLM's governing laws and regulations. To that end, Western has committed to perform the obligations specified in this Agreement, and it has commenced performance of those obligations by submitting a proposed sampling plan to the Agencies. The results of the sampling will be used to develop a suitable plan of operations pursuant to which Western will reclaim the specified portions of the site, in the manner set forth herein.

All parties desire to avoid the expenses, delays and other inefficiencies involved in adjudicating past, present and future disputes over Western's reclamation responsibilities at the Drum mine site. To accomplish that goal, the parties have agreed to settle and resolve all such disputes, and to terminate and resolve all pending formal adjudicatory proceedings before the Agencies by entering into this Agreement. Western's performance of the obligations imposed upon it in this Agreement shall constitute full, complete and final compliance by Western of all obligations with respect to the Drum mine site that have been or may be imposed upon it by any of the Agencies.

NOW, THEREFORE, for and in consideration of the mutual covenants set forth herein, the parties agree as follows:

1 Coordination of Agency Determinations To Be Made Under the Agreement.

1.1 Lead Agency.

As specified in the State Director's October 20, 1997, decision, since the Drum mine site occurs on federal land administered by BLM, BLM is and will remain the lead agent for all operations conducted on the site. Pursuant to the terms of the Memorandum of Understanding between DOGM and BLM concerning regulation of minerals mining and reclamation, BLM accepts lead responsibility for management of all operations and other obligations to be performed under this agreement. That responsibility shall be carried out in the manner set forth herein.

1.2 Notices.

Western shall submit copies of all plans and notices required under this agreement to each of the agencies at the addresses, or (where and when appropriate) by fax or e-mail as specified below.

BLM (State Office):
Mr. G. William Lamb
State Director
Utah State Office (UT-930)
Bureau of Land Management
P. O. Box 45155
Salt Lake City, UT 84145-0155
Phone: (801) 539-4010
Fax: (801) 539-4013 With cc to:

BLM (Area Office)
Mr. Rex Rowley, Area Manager
Bureau of Land Management
Fillmore Office
35 East 500 North
Fillmore, Utah 84631
Phone: (435) 743-3104
Fax: (435) 743-3135

Bruce Hill, Esq.
Office of the Solicitor
6201 Federal Bldg.
125 S. State Street
Salt Lake City, UT 84138-1180
Phone: (801) 524-5677 (ext. 228)
Fax: (801) 524-4506

DOGM:
Mr. D. Wayne Hedberg
Permit Supervisor
Division of Oil, Gas and Mining
1594 West North Temple, Ste. 1210
Box 145801
Salt Lake City, Utah 84114-5801
Phone: (801) 538-5286
Fax: (801) 359-3940

With cc of notices and cover letters to:
Mr. Dan Moquin
Office of the Attorney General
Natural Resources Division
1594 West North Temple, Ste. 300
Box 140855
Salt Lake City, Utah 84114-5801
Phone: (801) 538-5243
Fax: (801) 538-7440

DWQ:
Mr. Don Ostler, Director
Department of Environmental Quality
Division of Water Quality
288 North 1460 West
Salt Lake City, Utah 84116
Phone: (801) 538-6170
Fax: (801) 538-6715

Notices shall be provided to Western at the following address or fax:

WESTERN STATES MINERALS CORPORATION
Attn: John F. Carmody
4975 Van Gordon Street
Wheat Ridge, CO 80033
Phone: (303) 425-7042 ext. 23
Fax: (303) 425-6634

With cc to:
Craig R. Carver
Alfers & Carver, LLC
730 17th Street, Suite 340
Denver, CO 80202
Phone: (303) 592-7674
Fax: (303) 592-7680
e-mail: ccarver@alfers-carver.com

1.3 Administration of the Agreement.

All responses to be provided by the Agencies to Western under this agreement will be coordinated through BLM. Upon receipt of and prior to approval of any proposals submitted by Western hereunder, or any revisions thereof, the BLM will consult with and give due consideration to timely comments from DOGM and DWQ. If DOGM or DWQ cannot provide comments within 30 days of receipt of the proposal, BLM will proceed independently in processing it. Should there be any disagreement between any of the Agencies, BLM will take the lead in conducting whatever meetings or negotiations are necessary to resolve the problems, including raising the problem to the directors of the agencies for resolution, if necessary.

The Agencies shall inspect jointly or independently for compliance with all obligations of Western hereunder, and shall promptly notify the other agencies of operations not complying with such obligations.

2 Areas To Be Reclaimed By Western.

As specified in the State Director's October 20, 1997, decision, Western shall submit a plan of operations for, and shall reclaim, those portions of the Drum mine site which are identified on the attached Exhibit A as: lo-grade heap #1, lo-grade heap #2, lo-grade heap #3, hi-grade heap #6, hi-grade heap #7 (marked as HG7 and W7 on Exhibit A), one 3.6 acre waste dump (marked as W-3 on Exhibit A), one 5.2 acre waste dump (marked as W-2 on Exhibit A); plus Western shall reclaim the disturbance around Busby Spring, an unplugged drill hole above Busby Spring, and disturbances caused by exploration activities conducted under notices UT-057-39N, UT-056-64N, UT-056-062N, and unserialized notice submitted December 13, 1983 and unserialized notice submitted February 1, 1985.

In addition to the areas itemized in the BLM State Director's decision, DOGM has asserted that Western is responsible for reclamation of one 20.1 acre waste dump (marked as W-1). For and in exchange for the conditions set forth in this Agreement, Western has agreed that it shall sample and reclaim such area.

The areas identified above shall constitute, and be referred to as, the "Western Reclamation Areas." Western shall have no responsibility to reclaim any other portions of the Drum mine site.

3 The Sampling Plan.

3.1 Submission and Approval.

Western has submitted to each of the Agencies its proposed plan for sampling the characteristics of the Western Reclamation Areas. After consulting with DOGM and DWQ, BLM shall determine whether implementation of the plan as proposed will be adequate to characterize the Western Reclamation Areas for purposes of development of a reclamation plan for such areas. If so, then BLM shall provide notice to Western of its approval of the sampling plan. If not, BLM and Western shall consult in order to seek agreement on the nature and extent of any modifications needed in order to cause the plan to be adequate for such purposes. Once agreement is reached on the sampling plan, BLM shall provide Western with notice of its approval of the agreed-upon sampling plan.

3.2 Implementation.

As soon as practicable after receipt of an approved sampling plan from BLM, Western shall implement the provisions of the approved plan. All results and evaluations obtained as a consequence of implementation of the sampling plan shall be provided to the Agencies within 10 days after receipt by Western.

4 The Reclamation Plan.

4.1 Submission and Approval.

Within 60 days of Western's receipt of the results of the sampling of Western's Reclamation Areas, Western shall provide to the Agencies a detailed plan of operations to reclaim Western's Reclamation Areas in an efficient and effective manner, and in accordance with applicable laws and regulations. After consulting with DOGM and DWQ, BLM shall determine whether implementation of the plan as proposed will be adequate to reclaim the Western Reclamation Areas. If so, then BLM shall provide notice to Western of its approval of the reclamation plan. If not, BLM and Western shall consult in order to seek agreement on the nature and extent of any modifications needed in order to cause the plan to be adequate for such purposes. Once agreement is reached on the reclamation plan, BLM shall provide Western with notice of its approval of the agreed-upon reclamation plan.

4.2 Reclamation Standards and Monitoring.

Prior to commencement of reclamation activities, Western, BLM and DOGM shall mutually select an agreed-upon representative undisturbed off-site reference area and they shall inventory the density of base-line vegetative cover within such area. Unless a variance is granted under section 4.2.1 below, Western shall reclaim the Western Reclamation Areas pursuant to the requirements of R647-4-111.

4.2.1 Variances.

Western may pursue variances following the procedures mandated under R647-4-111 and R647-4-112 and this section 4.2.1. In the event that the results obtained from implementation of the Sampling and Characterization Plan establish to the reasonable satisfaction of DOGM that no specialized reclamation efforts will be required to deal with toxic materials at the site, then the amount of cover material applied to the areas to be reclaimed shall be such amount as Western, in its reasonable judgment, deems appropriate to result in the growths necessary to attain the reclamation standard imposed by R647-4-111 or a variance granted by the Division in writing.

If Western reduces the slopes of all facilities in the Western Reclamation Areas to a maximum 3 to 1 (horizontal to vertical) slope, and if Western prepares all surfaces to accept the growth media application, and if at least 6 inches of growth media are applied to all reclaimed and recontoured surfaces (with the appropriate additives applied, as determined by agronomic analyses), and if a diverse seed mix that includes adaptable perennial species native to the area is applied to all reclaimed areas, all to the reasonable standards and satisfaction of DOGM, then DOGM shall grant a variance to Western under R647-4-111.13 such that reclamation shall be deemed acceptable if the reclaimed areas have attained at least 50% of the vegetative density of

the off-site reference area within two growing seasons following the final seeding of the Western Reclamation Areas.

Notwithstanding the foregoing, if the results of Western's sampling program demonstrate the existence of hazardous materials in any of the reclamation areas that pose a realistic threat to migrate from the site into waters of the State or U.S., then BLM and DOGM shall retain all authority granted by law to impose such reclamation requirements as are appropriate to mitigate such threat.

Upon completion of the reclamation obligations as contained in the approved reclamation plan, Western shall be required to monitor the Western Reclamation Areas for the shorter of the period specified in R647-4-111.13 or any variance granted under this section.

4.3 Implementation.

As soon as practicable after receipt of an approved reclamation plan from BLM, Western shall implement the provisions of the approved plan.

5 Bonding.

5.1 Adequacy of Existing Bond.

The parties desire to increase the efficiency of the reclamation process. The parties also recognize that all activities to be conducted by Western on the Drum site are to take place on or in the immediate vicinity of previously disturbed lands. Western's activities will serve to reduce the potential impacts of the existing disturbances on the environment and the costs required to be spent in the future to reclaim the Western Reclamation Areas. Accordingly, for so long as Western remains in compliance with its obligations under this Agreement, the Agencies agree to accept Western's existing bond as adequate for purposes of securing Western's performance of its reclamation obligations hereunder. Should any of the Agencies determine that Western is not performing in conformance with its obligations under this Agreement, then at the conclusion of the dispute resolution and appeal procedures specified in Article 9 below the Agencies may separately establish any bonding obligations authorized under their governing law and regulations.

5.2 Reduction of Bond once Monitoring Phase of Reclamation Plan is Reached.

Within 45 days of the responsible Agencies' receipt of Western's written notice that their reclamation obligations have been fulfilled, a joint onsite inspection will be performed. Once the Agencies confirm and agree that the applicable reclamation performance standards have been satisfied, then DOGM shall commence proceedings to release all bond funds in excess of those necessary to accomplish actual costs of remaining reclamation or monitoring.

6 Status of Pending Administrative Proceedings.

Submission of its proposed Sampling Plan and execution of this Agreement by all parties constitutes timely compliance by Western of all requirements specified in the State Director's October 20, 1997, decision and the Area Manager's decision affirmed by such decision, and brings Western and its operations into compliance with Federal regulations.

Execution of this Agreement by all parties resolves and settles all issues between Western, DOGM and the Board of Oil, Gas and Mining, in the formal proceeding instituted before the Board entitled "In the matter of the petition filed by the Division of Oil, Gas and Mining For an Order requiring Immediate Reclamation of the Drum Mine From Western States Minerals Corporation and Jumbo Mining Company, Millard County, Utah," Docket No. 7-009, Cause No. M/027/007. Accordingly, Western and DOGM shall jointly file with the Board a notice of dismissal of Western from that proceeding.

Nothing contained in this Agreement shall release Jumbo Mining Company from any proceedings, liabilities or obligations pending or asserted or to be asserted by any of the parties to this Agreement.

7 Time Frames and Extensions.

The sampling plan addendum entitled "Addendum to the Characterization Sampling Program for Heap Leach Pads and Waste Rock Dumps Located at the Drum Mine, dated November 1997" contains tentative time frames for completion of the sampling and reclamation of Western's portion of the Drum Mine site. These time frames will be modified based on the analytical results of the sampling plan. Additional delays may be incurred due to equipment availability and weather. Western shall promptly notify BLM and DOGM of the particulars of the problem and of the additional time required to complete the obligations that are delayed by the problem. BLM and DOGM shall evaluate the problem and the delays incurred as a consequence thereof, and shall extend all affected deadlines by such period as it determines is warranted under the circumstances, which period shall not be less than any delay caused by forces outside of the reasonable control of Western.

8 Relationship Between Western, BLM and the Claimant/Operator of the Remaining Portions of the Drum Mine Site.

The activities undertaken by Western at the Drum Mine site are being conducted on unpatented mining claims on public lands of the U.S., managed by the BLM and regulated by the Agencies. Pursuant to laws and regulations governing such lands, the BLM and the State have issued orders requiring that Western undertake the reclamation activities described in this Agreement. All operations conducted by Western in conformance with such plan and any other BLM or State directives are undertaken under the authority of BLM and the State. The Drum Mine site is covered by unpatented mining claims and the portions of the site not covered by Western Reclamation Areas are operated by Jumbo Mining Company. Jumbo has recently filed for liquidation under Chapter 7 of the United States Bankruptcy Code. Consequently, the parties to this Agreement do not anticipate that any entity will operate or seek to operate the mine site during the pre-monitoring phase of Western's reclamation plan. However, should Jumbo or any successor-in-interest operate or propose to operate the site or any portion thereof, then BLM and the State shall exercise their authority and discretion under all applicable laws and regulations to either: (1) transfer all or any portion agreed to by Western of Western's obligations hereunder to the operator under such terms and conditions as are acceptable to BLM and the State; or (2) regulate operator's activities in such a manner as to prevent it from interfering with the performance of Western's obligations hereunder. In the event of a transfer of all or any portion of Western's obligations hereunder to the operator, then such transfer shall, as to the lands and

obligations affected, constitute a full, complete and irrevocable release of Western from any further obligations with respect to such lands and requirements.

9 Dispute Resolution and Appeal Procedures.

9.1 Notice of Breach.

In the event that any of the Agencies concludes that Western is not complying with its obligations hereunder, that Agency shall provide written notice to Western containing the full details of all breaches asserted to have occurred. Western shall have 30 days after receipt of such notice to either cure the asserted breaches, or dispute the assertions. Should Western dispute any of the breaches specified in the Agency notice, it shall provide a responsive notice to the Agency within 30 days of Western's receipt of the Agency's notice, setting forth the bases for its disagreement.

9.2 Mediation of Disputes.

Upon receipt of a responsive notice from Western, the Agency may work informally with Western toward resolution of the dispute. Whether or not the Agency chooses to work with Western toward resolution, it may, at any time after receipt of a responsive notice, invoke the mediation provisions of this Agreement by providing notice thereof to Western. Mediation shall be accomplished in the manner set forth in this Section 9.2.

9.2.1 Appointment of Mediator.

Within 3 days after receipt of the Agency's notice invoking mediation Western and the Agency shall meet and seek to reach agreement on the appointment of a mediator. In the event of failure to reach such agreement, each party shall present simultaneously to the other a list of five names of proposed mediators, ranked in order of preference (1 highest and 5 lowest). Each proposed mediator shall be a third party professional engineer registered in the State of Utah, with expertise in the issues raised by the dispute. The mediator selected shall be the individual who appears on the lists of both parties, with the highest total ranking. In the event that no engineer appears on both lists, then the process shall be repeated until a mediator is selected.

9.2.2 Mediation Procedures.

Within 30 days of selection of a mediator, the parties shall submit and exchange a written statement of their respective positions, along with all data and documentation deemed appropriate. Within 10 days of the written submission, the parties shall meet with the mediator and follow such procedures as are specified by the mediator in an effort to resolve the dispute. If, at the end of the mediation the parties are unable to reach agreement, then within 10 days thereafter the mediator shall submit to each party a written statement containing his or her recommended resolution of the dispute, and the bases therefore.

9.2.3 Costs of Mediation.

All fees and costs of the mediator shall be paid by Western.

9.2.4 **Procedures in the event that mediation does not resolve the dispute.**

If the parties to a dispute are not able to resolve their disagreement through mediation, then the Agency shall be entitled to issue such decisions and institute such procedures as are permitted by its governing rules and regulations to enforce the obligations of Western under this Agreement and under the Agency's laws, rules and regulations. In any such procedures, the mediator's recommended resolution shall be admissible evidence and both it and the testimony of the mediator may be submitted by either party.

10 Termination of this Agreement and Release of Western.

10.1 **Termination.**

Western shall notify the Agencies upon completion of its obligations hereunder. Western's obligations hereunder shall be deemed to be completed when Western's Reclamation Area has been revegetated to establish a diverse, effective and permanent vegetative cover in compliance with the requirements of Section 4.2 and the approved reclamation plan, and when any effluent discharged from such Area has met, without violations and without the necessity for additional treatment, applicable effluent limitations and water quality standards for at least 1 full year. BLM shall promptly inspect the reclaimed area with Western and will then notify Western in writing if it concurs that Western has successfully completed all such requirements, or, if it does not, then what requirements remain to be met. At such time as BLM and DOGM have concurred in writing that Western has successfully completed all its requirements hereunder, then DOGM shall release Western's remaining bond, and this Agreement shall terminate.

10.2 **Release.**

Termination of this Agreement in the manner specified in paragraph 10.1 above shall constitute the Agencies' full release of Western from any and all future obligations and responsibilities with respect to the Drum Mine site.

WESTERN STATES MINERALS CORPORATION

By Arden B. Morrow

Name Arden B. Morrow

Title President

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT

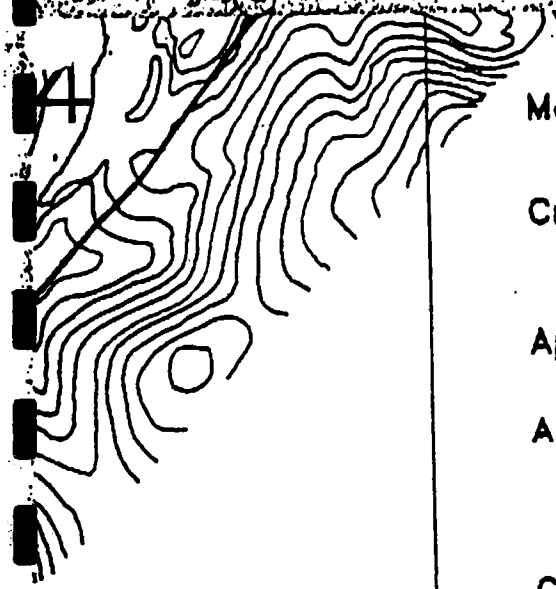
By G. William Lamb
Name G. William Lamb
Title STATE DIRECTOR 3/30/98

THE STATE OF UTAH, DEPARTMENT OF NATURAL RESOURCES, DIVISION OF OIL, GAS AND MINING

By Lowell P Braxton 3/30/98
Name Lowell P. Braxton
Title Acting Director

DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER QUALITY

By Dan A. Ostler
Name Dan A. Ostler
Title Director



Main Access Road

Cross-Section Line

Approximate Project Boundary.

Approximate Project Boundary.

Components assessed as WSMC's responsibility for characterization.

EXHIBIT A

N

0 200
FEET

WESTERN STATES MINERALS CORP.

DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T15S, R10W)

APPROXIMATE FINAL TOPOGRAPHY

D:\ACAD\DRUM\DRUMFINL.dwg

Addendum

This is an addendum to a Settlement and Reclamation Agreement ("Agreement") entered into between and among Western States Minerals Corporation and the United States Department of the Interior, Bureau of Land Management, and the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining and Department of Environmental Quality, Division of Water Quality. This addendum is only between Western States Minerals Corporation ("Western") and the Utah Department of Environmental Quality, Division of Water Quality ("DWQ").

This addendum is executed as an alternative to revising the Agreement. The parties to the Agreement desire that Western be able to immediately proceed with the activities outlined in the Agreement without having to revise the Agreement and obtain required approvals for the revision. Inasmuch as this addendum does not affect the parties to the Agreement, except as between Western and DWQ, it is executed separately. The Agreement is not acceptable to DWQ without this further addendum.

Western and DWQ agree that:

1. Nothing in the Agreement, to include the Recitals and paragraph 10, shall constitute or be construed as a release from any claim, to include a natural resource damage claim, which the State of Utah in its trust responsibilities may have against Western arising out of or relating to the release of pollutants to waters of the State by Western.

2. Nothing in the Agreement, to include paragraph 4, shall constitute or be construed to preclude DWQ from taking action to enforce compliance by Western with State permits or State laws with respect to ground water and surface water.

3. Western acknowledges that DWQ has not by the language and provisions of the Agreement, to include paragraphs 3 and 4, delegated or granted to BLM or DOGM any authority under State water quality laws over which it has jurisdiction.

4. Western acknowledges that even though the language in paragraphs 5 and 8 of the Agreement refers to "Agencies" and the "State," the determinations and responsibilities under those paragraphs are that of the Department of Natural Resources, Division of Oil Gas and Mining, and not the Department of Environmental Quality, Division of Water Quality.

Dated this 9TH day of April, 1998.

WESTERN STATES MINERALS CORPORATION

By _____
Name: Arden B. Morrow
Title: President

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

By _____
Name: Don Ostler
Title: Director

APPENDIX E

Request for Bid

Request for Bid

CONTRACT SPECIFICATIONS

for the

DRUM MINE RECLAMATION
MILLARD COUNTY, UTAH

March 1999

Prepared for
Western States Minerals Corporation

Prepared by
James Ashton – Senior Project Engineer

Western States Minerals Corporation

Drum Mine Reclamation
Millard County, Utah

Request for Bid

CONTRACT SPECIFICATIONS

March 1999

TABLE OF CONTENTS

MAP LIST

ITEM	MAP NAME	MAP NUMBER
1.	Approximate Final Topo	
2.	Current Topo	
3.	Growth Media Areas	

TABLE LIST

Table #	Table Description
#1	Salvage Growth Media
#2	Contour Heaps, Waste Dumps and Misc.
#3	Rip Compacted Areas
#4	Haul and Spread Growth Media
#5	Miscellaneous Contract Work

1. INTRODUCTION

Western States Minerals Corporation (WSMC) is seeking preliminary bids suitable to be used in a cost estimation report to be submitted to the Utah Department of Oil, Gas and Minerals (DOGM). The work is expected to take place beginning in September 1999. Formal bids will be sought once a final agreement and plan have been completed with DOGM and the other agencies involved. Your help is appreciated in this matter. The project is to reclaim a small open pit heap leach mine (254 acres), which was closed in 1991. The reclamation is expected to last 2 months from startup, which is planned for late summer to early fall 1999. The contractor will require no site-specific permits in order to perform this work.

The Contract Specification shall establish the Scope of Work for the Contract. The Contract Specification applies to the Form of Proposal and is directly supplemented by the following Contract Documents:

- Cover letter which contains instructions and information to Bidders
- Site Maps and Contract Drawings

The reclamation will occur on eight leach pads, six waste dumps (including LG-1, which was never leached) two-process ponds and two open pits. Maps 1 and 2 show the approximate final topography and the current topography respectively.

Basic construction parameters used for the reclamation are as follows:

Maximum overall slope:	3H to 1V
Minimum growth media:	6 inches
Contractor will provide own support:	

2. LOCATION

The Drum Mine site is located in Millard County, approximately 35 miles northwest of Delta, Utah. The mine facilities are in sections 7 and 8 of Township 15 South, Range 10 West. Situated in the Drum Hills, the site is semi-arid with mean annual rainfall of 7.79 inches. There are no perennial streams on the property, and runoff is limited to periods of snowmelt and major storms. The elevation of the mine is from 5,800 to 6,300 feet with mean temperature of 50.1 degrees Fahrenheit. Please refer to Figure #1, Drum Mine Location Map.

Access to the property is shown on Figure #2 and #3.

2.1 SITE CONDITIONS

The Drum Mine is in an area of moderate relief, adjacent to the Drum Mountains. Elevations range from 5,800 feet to 6,300 feet. The terrain is characterized by rolling hills to slightly mountainous. There is minor evidence of past mining activity in the immediate area.

Temperatures in the area are moderate with maximum daytime summer temperatures generally under 90 degrees and nighttime temperatures usually above 30 degrees. Winter temperature extremes vary between highs in the 40's to lows of 20 below zero.

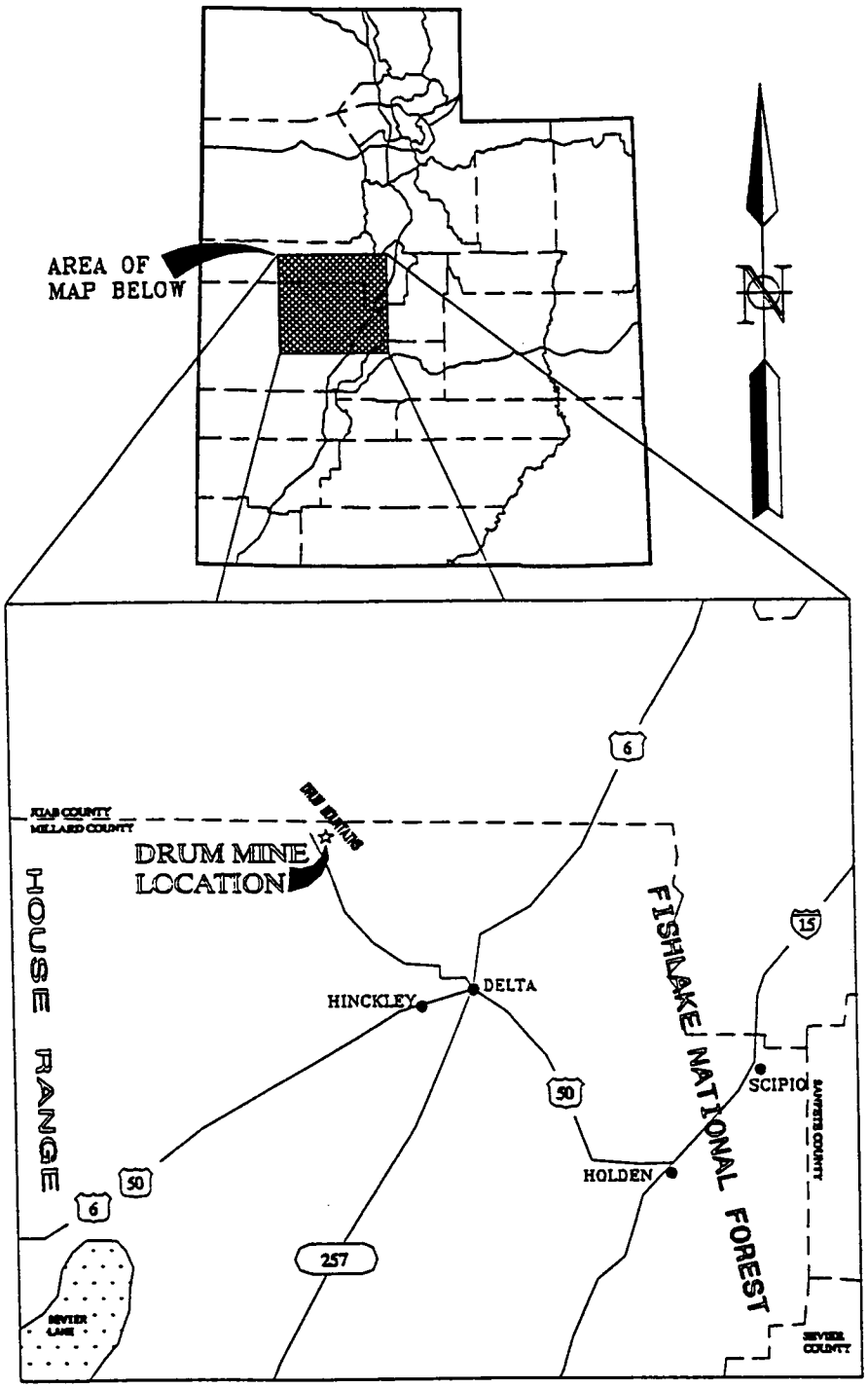
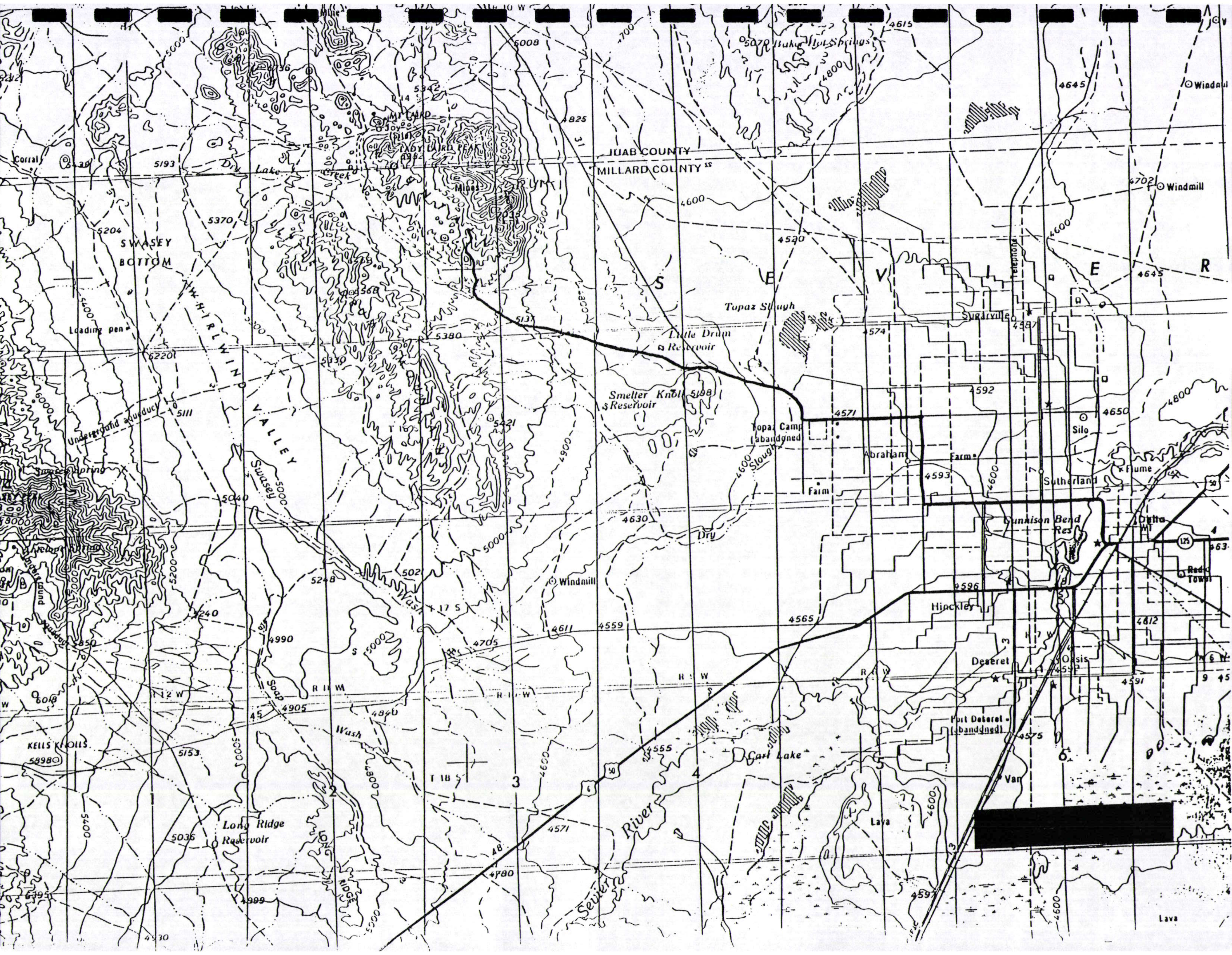
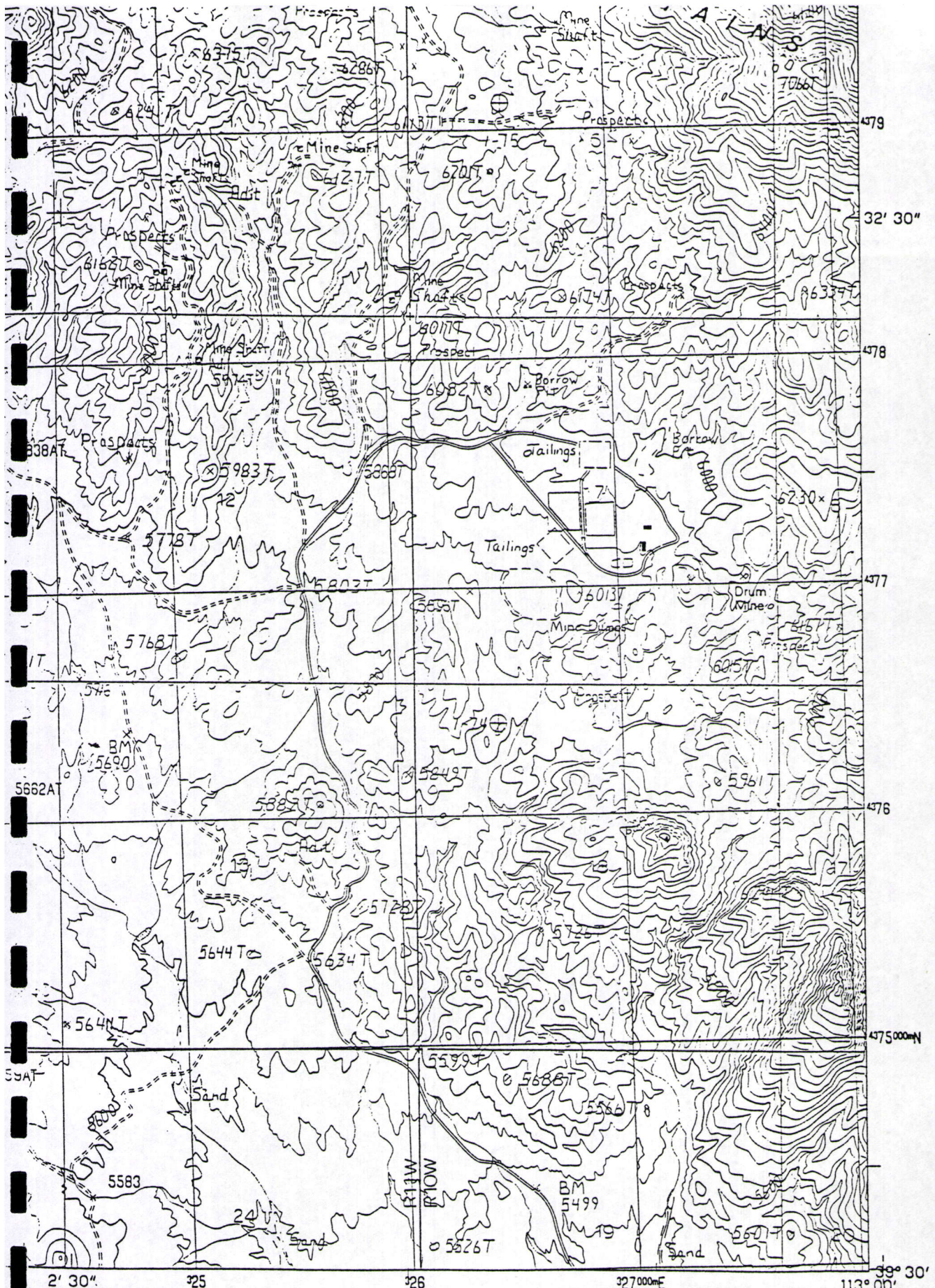


FIGURE #1
DRUM MINE LOCATION MAP



JUAB COUNTY
MILLARD COUNTY
SEVIER
Topaz Slough
Sugarville
Little Drum Reservoir
Smelter Knoll Reservoir
Topaz Camp (abandoned)
Abraham
Farm
Silo
Sutherland
Flume
Gunnison Bend Res
Delta
Radio Tower
Hinckley
Deseret
Oasis
Fort Deseret (abandoned)
Van
Lava
Carl Lake
Sevier River
Dry
Windmill
SWASEY BOTTOM
WHIRLWIND VALLEY
Swasey
Wash
Soap Wash
Loading pen
Underground aqueduct
Corral
Dry Lake Creek
Long Ridge Reservoir
LONG RIDGE
KELLS KNOLLS
Baker Hot Springs
Telephone
Slough
[redacted]



AL SURVEY, RESTON, VIRGINIA-1989

UTAH

QUADRANGLE LOCATION

1 10000

1	2	3	1 Topaz Mountain West

ROAD LEGEND

Improved Road . . . . . ═══

Unimproved Road . . . . . ═ ═ ═

Trail . . . . . ─ ─ ─

Interstate Route U.S. Route State Route

Precipitation in the area is limited, averaging eight to ten inches annually. Most precipitation occurs as snow in the winter and as rain in September and October. Precipitation the rest of the year is minimal.

3. DEFINITIONS

The following definitions shall apply to this Agreement:

- The term **"Overburden"** shall mean all materials which are necessary to excavate (or **"strip"**), remove, handle, transport, stockpile, spread and dispose in order to perform Work, hereinafter defined. The term **"Overburden"** shall include, **"Heap Material" and "Waste Overburden or waste"** (all hereinafter defined), which may exist within the aforesaid material to be so contoured per instructions of WSMC's Representative.

- The term **"Growth Media"** shall mean all material so designated by WSMC's Representative and shall generally be that portion deemed suitable to sustain plant life.

- The terms **"Waste Overburden or waste"** shall mean that portion of Overburden, which is not Growth Media.

- The terms **"Waste Dump or Overburden Storage Area"** shall mean any of the areas, which are designated, for Waste Overburden placement by WSMC's Representative.

- The term **"Growth Media Stockpile Area"** shall mean any of the areas, which contain stockpiles of growth media as designated by WSMC's Representative.

- The term **"Pit Area"** shall mean the areas shown on the attached Maps 1 and 2 for the SW EX pit and NR pit.

- The term **"Underground Workings"** shall mean any previous, man-made subsurface void which includes stopes, raises, winzes, drifts, shafts, adits, etc. created by prior owners or operators.

- The term **"Cubic Yard"** shall me a cubic yard of inplace stacked material, deemed to contain 1.5 tons by weight.

- The term **"Ton"** shall mean one short ton or 2,000 pounds, avoirdupois.

- The terms **"Leach Pad or Heap Leach Pad"** shall mean those areas of the Drum Mine site referred to as Heap Leach Pads on Map 1 and 2.

4. SCOPE OF WORK

Except as otherwise provided in this Agreement, the Contractor, as an independent contractor, shall provide and furnish all personnel, services, materials, equipment and other necessities which are required for its performance of the Work (hereinafter called the **"Work"**) hereinafter described, and shall perform and complete the Work. The aforesaid personnel and services shall include, but not be limited to; labor, supervision and transportation, and aforesaid necessities shall include, but not be limited to; materials, tools, equipment, supplies, fuel and all other items required for the performance of the Work.

The Work shall include but not be limited to the following:

1. Dispose of all remaining refuse. A new landfill pit will need to be established on W1 for disposal of refuse (See Map 2). (See Table #5)

2. Salvage all available growth media near the toe of the Heaps and Waste Dumps prior to contouring. Approximately 12.3 acres to clear. (See Table #1)

3. Contour all Heaps, Waste Dumps and other areas to a maximum of 3H to 1V slopes. Approximately 420,300 cubic yards of material to push. (See Table #2)

4. Rip or loosen all compacted areas prior to placement of growth media. Approximately 55 acres of compacted surfaces. (See Table #3)

5. Haul and spread a minimum of six inches of growth media over all disturbed areas, which are accessible. The growth media will be obtained from the areas as designated by WSMC. Map 3 shows areas where growth media is available. Approximately 136,400 cubic yards of growth media are required to cover an area of approximately 181 acres. (See Table #4) A minimum of six inches of growth media must be left at any borrow area used.

6. Establish approximately 5200 feet of drainage channel (See Map 1). The channel will be a V-shape ditch approximately four feet deep with side slopes of 3H:1V. Some large boulder will need to be placed for energy dispersion during high runoff. (See Table #5)

7. Construct approximately 7,000 feet of perimeter berm around the two pits (See Map 1). The berm will be approximately eight feet high. (See Table #5)

8. Fill and contour the two process ponds and surrounding area. The ponds will be filled with material from W2. Approximately 66,000 cubic yards of material will be required to fill the ponds, which cover an area of approximately 4.5 acres. (See Table #5) These should be filled, such that no depressions remain.

9. Remove old concrete foundations and place in process ponds prior to filling. There are three concrete pads remaining; one 40' X 100', one 20' X 20' and one 10' X 10'. (See Table #5)

10. Remove all remaining roads and compacted surfaces. Re-contour (minimum 3H to 1V slope) and scarify the growth media supply areas. Approximately 45 acres. (See Table #5)

11. Haul and spread 2 tons/acre manure over the reclaimed mine site and growth media supply areas. Approximately 254 acres. (See Table #5)

12. Prepare and seed all reclaimed areas using the seed mixture supplied by WSMC. Approximately 254 acres. (See Table #5)

5. WORK INCLUDED

1. Mobilization of all required equipment to the work site.
2. Dispose of all remaining refuse.
3. Contouring all heaps, waste dumps and miscellaneous areas.
4. Haul and spread growth media over all disturbed areas that have been contoured and scarified.
5. Rip or loosen all compacted areas.
6. Establish drainage pathways through the site.
7. Construct perimeter berm around the two pits.
8. Seed and Fertilize (spread manure) over entire reclaimed site.
9. Repair any perimeter fence destroyed or removed during the work.
10. Control of dust during operations.
11. Repairs of all the Contractor's equipment as needed.
12. Fueling and lubricating Contractor's equipment.
13. Furnishing all material, tools, labor, supervision, transportation, equipment, supplies and other items to conduct 5(1) through 5(10) inclusive.

6. WORK EXCLUDED

1. Decommissioning of any facilities not mentioned above.
2. Reclamation of old exploration drill holes and roads.

7. SCHEDULING

1. The Contractor shall try to schedule the Work to be completed in a two-month period.

2. The contractor shall utilize accepted, effective scheduling techniques throughout the course of the Work. WSMC's Representative will request periodic meetings to review the Contractor's progress, manpower, reports and future planning.

3. WSMC's representative will approve all changes to the schedule or work to be performed.

8. OWNER FURNISHED ITEMS

Owner shall supply the following for the Work:

1. All surveying and boundary staking as needed.

2. Water for the Contractor's dust control may be made available, but no guarantees.

9. CONTRACTOR FURNISHED ITEMS

1. A trained, skilled work force.

2. Adequate equipment, supplies, and work personnel to complete the work in the designated time frame.

3. First aid capability, transportation for Contractor employees, mobile mine communication, security for Contractor supplies.

10. REPORTS REQUIRED FROM CONTRACTOR

1. Daily report summarizing the work completed the following day and an estimate of the total material contoured, hauled, spread, ripped or excavated.

2. Accident investigation reports from any accident resulting in lost time from the job for any of the Contractor's employees, or accidents resulting in the property damage over $500.00 to any of the Contractor's equipment.

3. Weekly progress reports stating percent completion of the reclamation compared to the planned schedule, and stating a brief plan for the upcoming week.

4. The Progress Payment Certificate, Invoice and Wavier of Lien will be discussed in the Contract Document.

11. OTHER CONTRACTORS

1. WSMC may be awarding other contracts on this project. The Contractor shall fully cooperate with other Contractors and carefully fit its work to other work as may be directed by WSMC's Representative. The Contractor shall not commit or permit any act, which will interfere with the performance of work by any other contractor.

2. The Contractor shall coordinate the Work in an acceptable manner and perform it in a proper sequence that will not hinder other contractors or WSMC's activities in the work area.

12. CONFIDENTIALITY

1. No information relative to the Work shall be released by the Contractor, either before or after completion of the Work, for publication or for advertising purposes without the prior written approval of WSMC.

2. All information obtained by the Contractor during the performance of the Work shall be treated by the Contractor as being confidential, and shall be disclosed by the Contractor only to representatives of WSMC designated by WSMC's Representative to receive such information.

13. SPECIAL PROVISIONS

1. Contractor shall provide drinking water and sanitation facilities for its employees.

2. Contractor shall not drain waste oil at the Drum Mine site, other than into proper containment vessels and shall have all waste oil and waste lubricants disposed of properly.

3. Contractor shall clean up site of all trash, scrap and waste material they generated and dispose of it properly.

4. Contractor shall provide guidelines for safe and efficient transportation to the project site.

5. Contractor agrees to operate, adhere to all applicable federal, state and local safety and environmental regulations.

6. Contractor shall instruct its employees to protect any archeological sites and inform WSMC of any disturbance of any such sites that are encountered.

14. MEASUREMENTS AND PAYMENTS

The volume of material contoured, hauled, spread, ripped, or excavated shall be calculated by the following methods.

1. The Contractor and Owner shall mutually agree to settle any disagreements on site using professional judgement.

2. The current topographic map (Map 1) will be considered the best available reference.

3. Each phase of the project will be treated as a lump sum bid. If extra work is needed, then a unit basis (cubic yard, etc) will be used. If the area in question is not overwhelming, a survey will be completed and a volume calculated.

4. On a daily basis, or as often as needed, the Contractor and WSMC shall discuss the work being done and determine that it is, or is not within the scope of the contract. All disputes will be settled prior to that work continuing.

5. The Contractor shall furnish to WSMC copies of all equipment time sheets and showing loads hauled.

TABLE #1 - SALVAGE GROWTH MEDIA COST

AREA	SALVAGE LENGTH (FT)	SALVAGE WIDTH (FT)	SALVAGE AREA (ACRES)	Salvage Depth (FT)	Salvage Volume (CU YD)	BID PRICE ($)	UNIT PRICE ($/ACRE)
HG1	1,400	15	0.48	2	1,556		
HG2	2,000	15	0.69	2	2,222		
HG3	1,650	20	0.76	2	2,444		
HG4&5	1,900	30	1.31	2	4,222		
HG6	900	25	0.52	2	1,667		
HG7	0	0	0.00	2	0		
LG1	800	10	0.18	2	593		
LG2	800	30	0.55	2	1,778		
LG3	1,300	40	1.19	2	3,852		
W1	2400	40	2.20	2	7,111		
W3	800	15	0.28	2	889		
W4	200	5	0.02	2	74		
W7	2000	40	1.84	2	5,926		
HG6-RAMP	700	15	0.24	2	778		
MISC.	0	0	2.00	2	0		
TOTAL			12.26		33,111		

TABLE #2 - CONTOUR HEAPS, WASTE DUMPS AND MISC.

AREA	CREST LENGTH (FT)	AVERAGE HEIGHT (FT)	AVE PUSH DISTANCE (FT)	VOLUME TO MOVE (LCY)	BID PRICE ($)	UNIT PRICE ($/LCY)
HG1	1,538	23	32	8,601		
HG2	2,000	14	20	3,481		
HG3	1,410	27	38	10,862		
HG4&5	2,903	42	59	54,189		
HG6	763	36	50	10,456		
HG7	1,916	26	36	13,696		
LG1	1,080	12	17	1,640		
LG2	1,704	58	81	60,650		
LG3	1,411	47	66	32,976		
W1	2,478	60	84	94,439		
W2	1,515	45	63	32,488		
W3	1,216	20	28	5,134		
W4	350	10	14	376		
W7	1,912	55	77	61,184		
HG1-RAMP	880	10	14	945		
HG6-RAMP	491	20	28	2,073		
LG2-WASTE	1,322	35	49	17,137		
LG3-WASTE	522	30	42	4,969		
MISC.	NA	NA	NA	5,000		
TOTAL				420297		

Note:
There is an existing buried landfill on W1 (see Map 2). During the contouring of this waste dump, extra precautions will need to be taken so as to not disturb this area, to the extent possible.

TABLE #3 -RIP COMPACTED AREAS

AREA	AREA TO RIP (ACRES)	BID PRICE ($)	UNIT PRICE ($/ACRE)
W1	9.40		
W2	5.40		
W3	3.00		
W4	2.20		
W7	5.10		
LG3-RAMP	1.20		
SW EX PIT	4.90		
NR PIT	4.10		
POND/FACILY	17.90		
OTHER-ROADS	2.50		
TOTAL	55.70		

TABLE #4 - HAUL AND SPREAD GROWTH MEDIA

AREA	ACREAGE	VOLUME (LCY)	DISTANCE TO BORROW (FT)	BID PRICE ($)	UNIT PRICE ($/LCY)
HG1	8.6	6,940	2,998		
HG2	8.8	7,120	2,085		
HG3	8.1	6,520	2,258		
HG4&5	17.8	14,380	4,564		
HG6	3.3	2,700	3,539		
HG7	9.4	7,600	3,574		
LG1	3.5	2,860	931		
LG2	7.9	6,360	4,874		
LG3	7.4	5,980	5,125		
W1	20.1	16,240	2,526		
W2	14.9	12,000	3,173		
W3	5.9	4,780	4,910		
W4	3.5	2,830	4,440		
W7	13.4	10,800	3,749		
HG1-RAMP	2.9	2,340	2,310		
HG6-RAMP	1.7	1,390	3,100		
LG2-WASTE	10	8,060	4,991		
LG3-WASTE	5.3	4,250	4,744		
SW EX PIT ROAD	4.9	3,940	4,089		
NR PIT ROAD	4.1	3,280	5,416		
OND/FACILITIES	17.9	4,810	500		
OTHER - ROADS	1.5	1,220	3,888		
TOTAL	180.9	136,400			

NOTE:

Growth media borrow areas are shown on Map #3 (approximate recovery depths are given). Remember, a minimum of six inches of growth media must remain at all borrow areas.

TABLE #5 - MISCELLANEOUS EARTHWORK

TASK	ACREAGE	VOLUME (LCY)	LENGTH (FT)	BID PRICE ($)	UNIT PRICE ($)
ESTABLISH DRAINAGE CHANNELS			5,200		$/FT_____
CONSTRUCT PIT PERIMETER BERMS			7,000		$/FT_____
FILL AND CONTOUR PROCESS PONDS	4.5	66,000			$/LCY_____
REMOVE OLD CONCRETE FOUNDATIONS	4500 SQ. FT.				$/SQFT_____
SCARIFY ALL REMAINING COMPACTED AREAS	45				$/ACRE_____
DISPOSE OF ALL REMAINING REFUSE (1)					$/DAY_____
HAUL AND SPREAD 2 TONS/ACRE MANURE (2)	254				$/ACRE_____
PREPARE SURFACE & SPREAD SEED (3)	254				$/ACRE_____
TOTAL	557.5	66,000	12,200		NA

NOTES:

(1) This activity includes the construction of a new landfill site on the top of W1. The remaining process building has been sold and will be removed.

(2) This activity includes obtaining the manure and transporting it to the site. The method of spreading is left to the contractor.

(3) During or prior to seeding, the surface will need to be prepared (ie, making small divots or furrows) in which the seed can germinate. Method will need to be approved by WSMC.

WESTERN STATES MINERALS CORPORATION

FORM OF PROPOSAL

TO: WESTERN STATES MINERALS CORPORATION

CARE OF: 250 SOUTH ROCK BLVD., SUITE 130
Reno, Nevada 89502
(775) 856-3339
ATTENTION: James Ashton

SUBJECT: BID PROPOSAL: DRUM MINE - RECLAMATION

The undersigned Bidder certifies that it has examined the Request for Contract Bid and all attachments listed therein for the above subject Contract. That it has checked all prices shown in this Bid document and understands that Western States Minerals Corporation (WSMC) will not be responsible for any errors or omissions made by the Bidder in the preparation of this Proposal.

It is understood that this Proposal constitutes a preliminary offer, which represents their best estimate of the work to be completed. It is further understood that the prices quoted herein will not be subject to any adjustment for escalation.

The Bidder agrees that the Contract Documents included with the Bid, a copy each of which have been furnished to the Bidder by WSMC's Engineer, are the basis for this Bid.

This Bid Proposal acknowledges receipt, understanding, and full consideration of the following addenda: _____(if no addenda have been received, state "None").

WESTERN STATES MINERALS CORPORATION

FORM OF PROPOSAL

Table of Contents

FORM OF PROPOSAL

1.0 PREAMBLE BY WSMC

1.1 A Proposal to be fully responsive must include a price for each item of Section 2.0, **BID SCHEDULE,** quoted and a reply to each subsequent section of the Proposal.

1.2 It will also be considered by WSMC that the Bidder has made allowances in its prices for the entire cost requirement of the Contract Specifications, General Specifications, Drawings, and other Contract Documents.

1.3 The Bidder shall submit, in Section 2.0; **BID SCHEDULE,** the total bid and unit prices for each item of Work.

1.4 The rates quoted under Section 3.0; **LABOR RATES AND EQUIPMENT RENTAL RATED - CHANGED OR EXTRA WORK,** of the Proposal will be used for work outside of the scope of the Contract and for which price cannot be established. Whenever possible, these rates and the supplementary unit prices will be used to negotiate a Lump Sum amount. However, on an emergency basis, changed or extra work may be performed on a time-and-materials basis using these rates and unit costs under Work authorization procedures.

1.5 The Bidder shall submit the following attachments with the Proposal:

1.5.1 A brief statement of the project goals and the approach to be used in fulfilling them.

1.5.2 A brief description of how the Work requested will be completed, the outline of field procedures, the equipment which will be utilized, and the work schedule which will be employed, e.g. a time line of the tasks with start time, duration, and finish time.

1.5.3 A complete Staff Organization Chart; including Project Manager, Field Engineers, Safety Coordinator, Office personnel, and other key employees.

1.5.4 A brief resume for each key employee named on the Staff Organization Chart. WSMC reserves the right to request replacement of any candidate offered.

2.0 BID SCHEDULE

The Bidder proposes to conduct the reclamation of the Drum Mine Site in accordance with the Contract Specification and the Drawings for the following prices:

ITEM DESCRIPTION	TOTAL PRICE	UNIT PRICE
DISPOSE OF ALL REMAINING REFUSE	$_____	$_____
SALVAGE GROWTH MEDIA	$_____	$_____
CONTOUR HEAPS, WASTE DUMP, MISC.	$_____	$_____
RIP COMPACTED AREAS	$_____	$_____
HAUL AND SPREAD GROWTH MEDIA	$_____	$_____
ESTABLISH DRAINAGE CHANNELS	$_____	$_____
CONSTRUCT PIT PERIMETER BERMS	$_____	$_____
FILL AND CONTOUR PROCESS PONDS	$_____	$_____
REMOVE OLD CONCRETE FOUNDATIONS	$_____	$_____
SCARIFY REMAINING COMPACTED AREAS	$_____	$_____
HAUL AND SPREAD MANURE	$_____	$_____
BROADCAST SEED ALL RECLAIMED AREAS	$_____	$_____
TOTAL BID	$_____	$_____

3.0 LABOR RATES AND EQUIPMENT RENTAL RATES FOR CHANGED OR EXTRA WORK

WSMC authorizes the use of the following labor rates and equipment rental rates only as expressly approved by WSMC's Representative. All rates are based upon a 40-hour workweek and include insurance benefits, travel, per diem, taxes, small tools, consumables, overhead, and profit.

3.1 Labor Rates

CLASSIFICATION	BASE HOURLY RATE	OVERTIME RATE

3.2 Equipment Rental Rates

MAKE & MODEL	BASE HOURLY RATE	OVERTIME RATE	VINTAGE

COMPANY OR SIGNATURE:

_____

4. 0 SUBCONTRACTORS AND SUPPLIES

4.1 The Bidder shall indicate below all of the Work intended to be subcontracted to others.

DESCRIPTION	SUBCONTRACTOR/ADDRESS

4.2 The Bidder shall indicate below all of the major suppliers of equipment and materials.

DESCRIPTION	SUPPLIER/FABRICATOR

COMPANY OR SIGNATURE

5.0 DESIGNATION OF REFERENCES

The following references can attest to the Bidder's knowledge of Conventional Reclamation work, and the abilities and experience of the Bidder's proposed principal representatives:

Company and Job Location	Contact Name & Telephone No.
1.	
2.	
3.	

6.0 DESIGNATION OF REPRESENTATIVES

6.1 The Bidder designates the following as its principal representative who, on behalf of the Contractor, will complete charge of the Contract.

Name: _____

Capacity: _____

6. 2 The Bidder designates the following as its principal representative who, on behalf of the Contractor, will have charge of the Work performed on the site.

Name: _____

Capacity: _____

6. 3 The Bidder designates the following as its designated foreman on shifts other than day-shift or in the absence of the principal site representative.

Name: _____

Capacity: _____

_____
COMPANY OR SIGNATURE

6.4 The Bidder designates the following as its designated safety representative, who will be in charge of assurance of legal compliance.

Name: _____

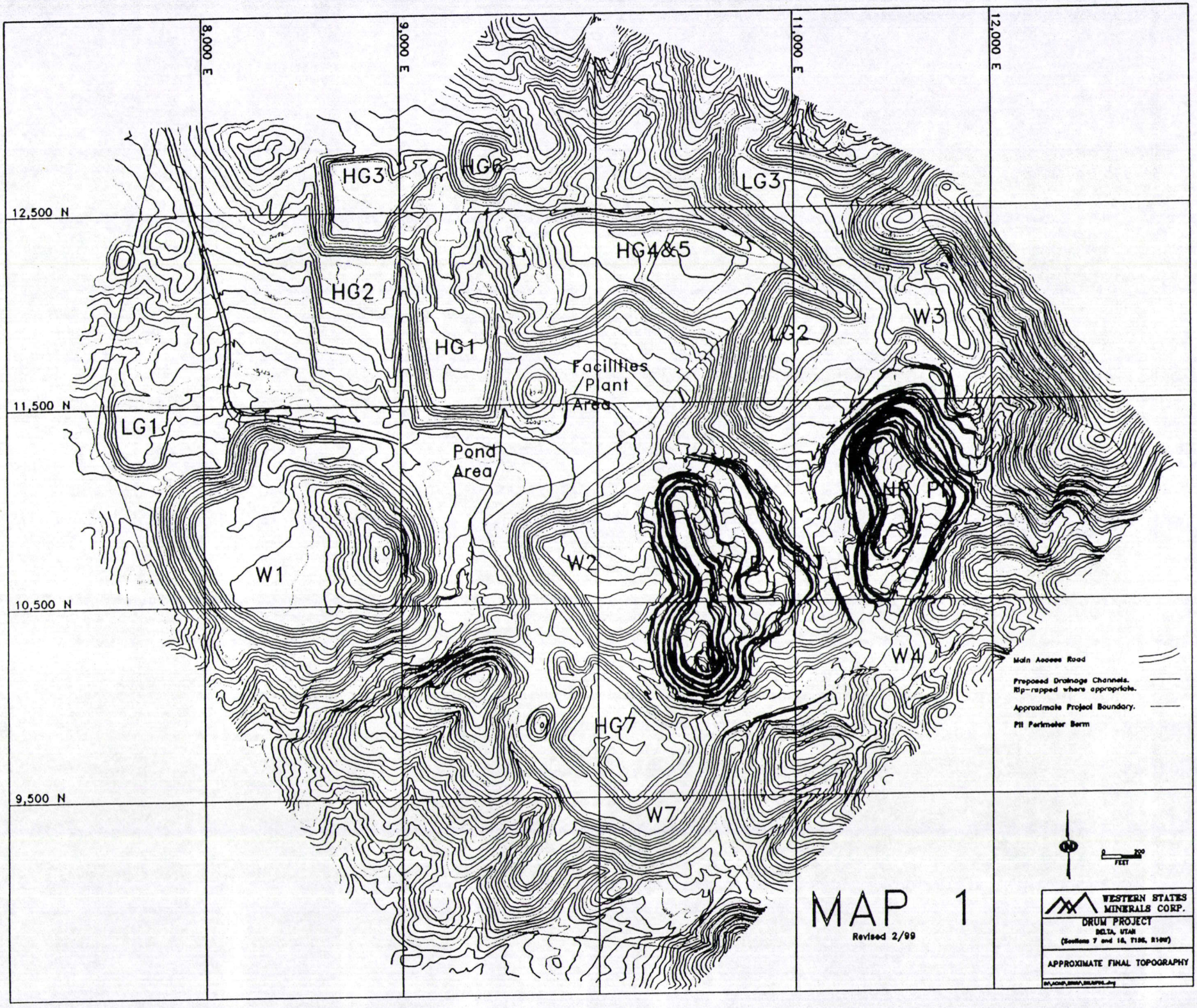
Capacity: _____

7.0 EXCEPTIONS AND QUALIFICATIONS

Exceptions or qualifications taken by the Bidder to any of the documents furnished with this Invitation, or clarifications to this Proposal shall be stated below and, if none, the Bidder shall state "**NONE**". (If extensive, submit a detail letter)

_____

COMPANY OR SIGNATURE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9,000 E
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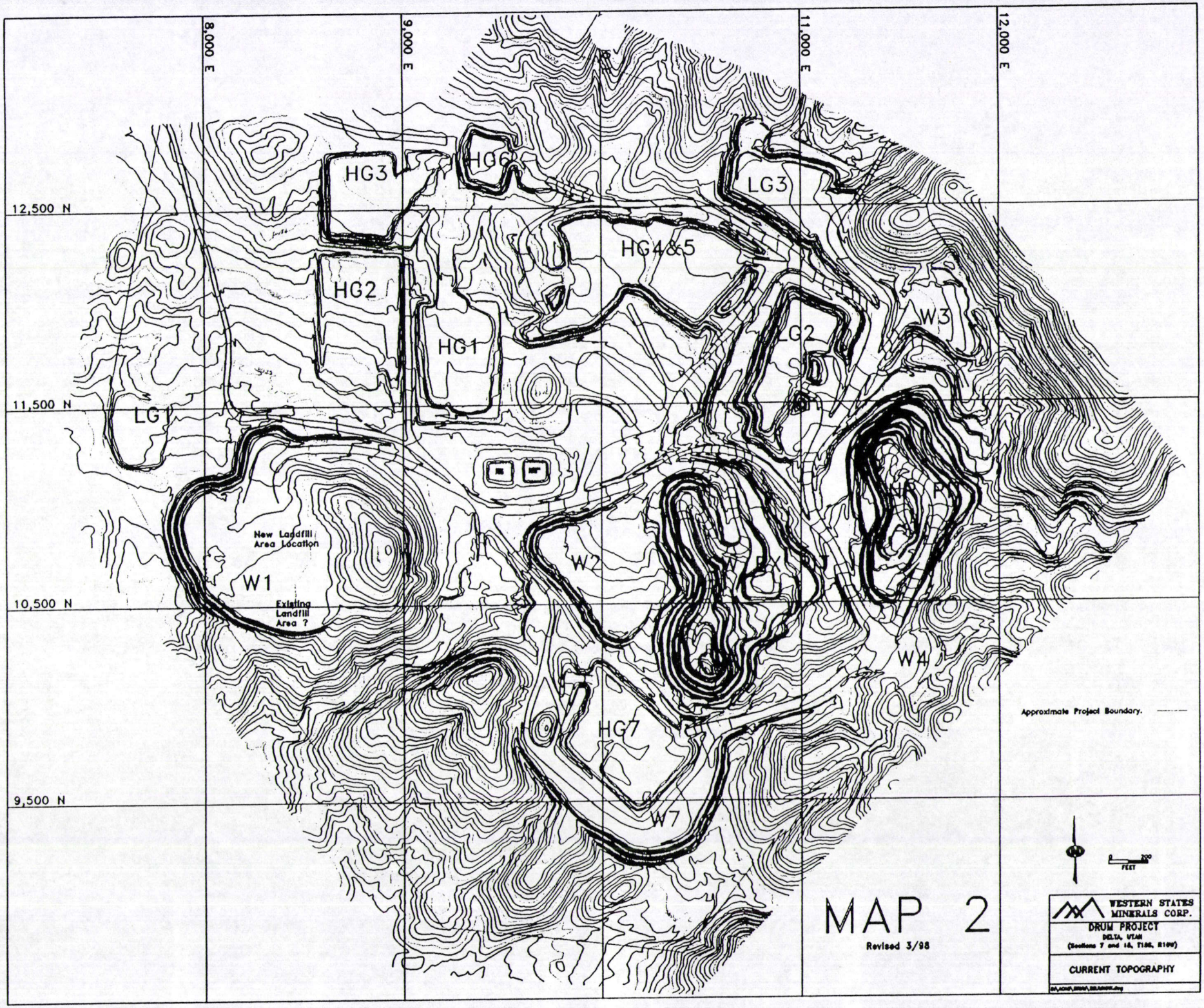
12,000 E
12,500 N
11,500 N
10,500 N
9,500 N
HG3
HG6
LG3
HG4&5
HG2
HG1
LG2
W3
Facilities
/Plant
Area
LG1
Pond
Area
W1
W2
W4
HG7
W7
Main Access Road
Proposed Drainage Channels.
Rip-rapped where appropriate.
Approximate Project Boundary.
Pit Perimeter Berm
FEET
MAP 1
Revised 2/99
WESTERN STATES
MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
APPROXIMATE FINAL TOPOGRAPHY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12,500 N
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10,500 N
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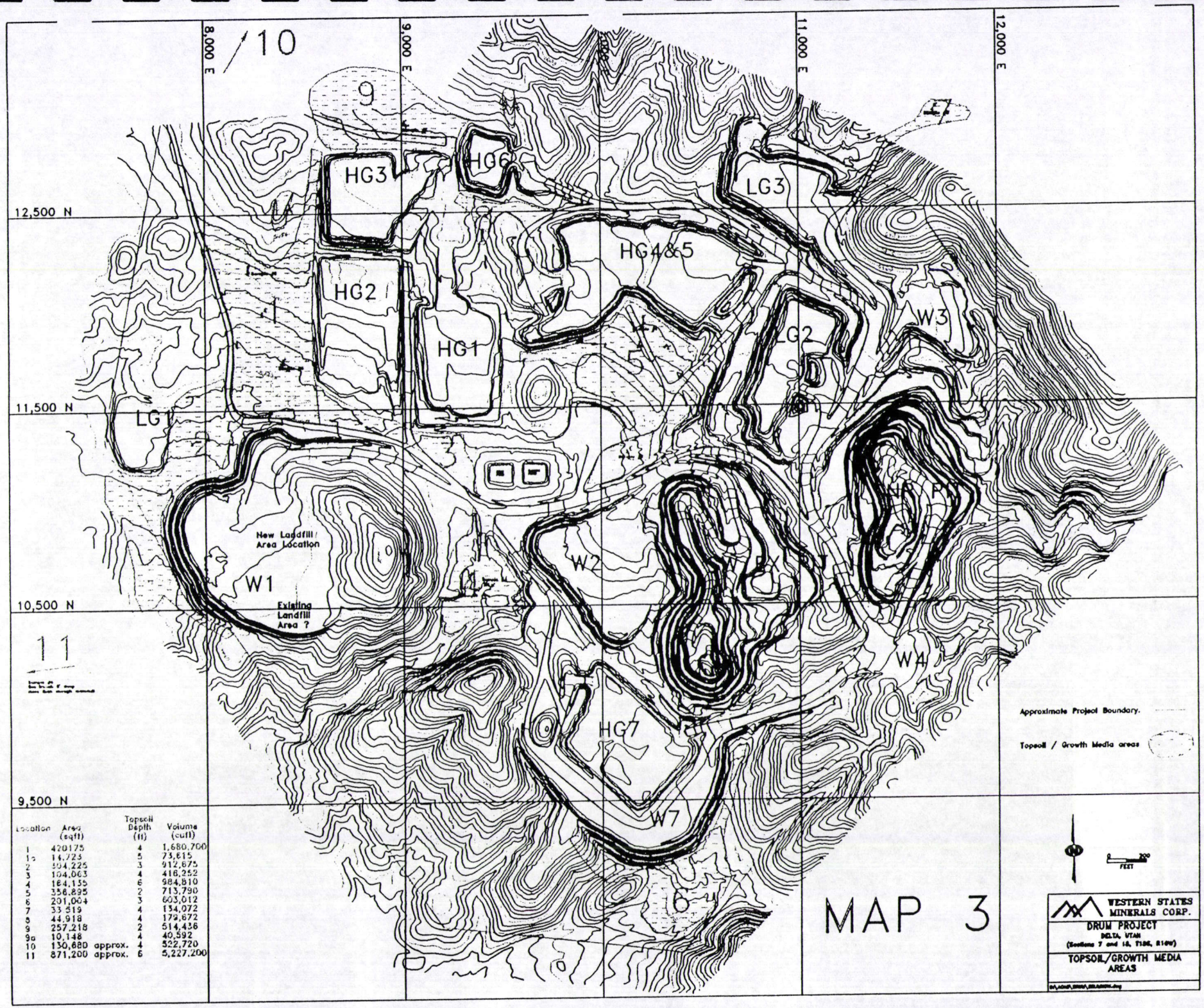
HG3
HG6
HG4&5
HG2
HG1
HG7
LG3
LG2
LG1
W3
W2
W1
W4
W7
New Landfill Area Location
Existing Landfill Area ?
Approximate Project Boundary.
MAP 2
Revised 3/98
WESTERN STATES MINERALS CORP.
DRUM PROJECT
DELTA, UTAH
(Sections 7 and 18, T18S, R19W)
CURRENT TOPOGRAPHY



Location	Area (sqft)		Topsoil Depth (ft)	Volume (cuft)
1	420175		4	1,680,700
1a	14,723		5	73,615
2	304,225		3	912,675
3	104,063		4	416,252
4	164,155		6	984,810
5	356,895		2	713,790
6	201,004		3	603,012
7	33,819		4	134,072
8	44,918		4	179,672
9	257,218		2	514,436
9a	10,148		4	40,592
10	130,680	approx.	4	522,720
11	871,200	approx.	6	5,227,200

APPENDIX F

Contractor Bid Results

ROBINSON CONSTRUCTION

P.O. Box 552, Orem, Utah 84057 (801) 225-5222 Oil Field Dirt Contractors

March 26, 1999

Western State Mineral Corporation
250 S. Rock Blvd Ste. 130
Reno, NV 89502

Attn: Buzz Gerick
Jim Ashton

Re: Bid Proposal
Reclamation of Drum Mine

Dear Buzz:

I enjoyed visiting with you the other day and look forward to meeting you.

If you have questions regarding our bid or if we can be of further assistance, please call.

Sincerely,

Eric R. Robinson
ERR/mw

2.0 BID SCHEDULE

The Bidder proposes to conduct the reclamation of the Drum Mine Site in accordance with the Contract Specification and the Drawings for the following prices:

ITEM DESCRIPTION	TOTAL PRICE	UNIT PRICE
MOBILIZATION	$98,000.00	LUMP SUM
DISPOSE OF ALL REMAINING REFUSE	$19,498.00	LUMP SUM
SALVAGE GROWTH MEDIA	$45,000.00	$3,658.54/ACRE
CONTOUR HEAPS, WASTE DUMP, MISC.	$402,616.00	$0.72/CYD
RIP COMPACTED AREAS	$11,220.00	$204.00/ACRE
HAUL AND SPREAD GROWTH MEDIA	$231,200.00	$1.70/CYD
ESTABLISH DRAINAGE CHANNELS	$21,840.00	$4.20/LF
CONSTRUCT PIT PERIMETER BERMS	$28,700.00	$4.10
FILL AND CONTOUR PROCESS PONDS	$75,900.00	$1.15
REMOVE OLD CONCRETE FOUNDATIONS	$4,000.00	LUMP SUM
SCARIFY REMAINING COMPACTED AREAS	$21,410.00	LUMP SUM
HAUL AND SPREAD MANURE	$39,624.00	$156.00/ACRE
BROADCAST SEED ALL RECLAIMED AREAS	$33,274.00	$131.00/ACRE
TOTAL BID	$1,032,282.00	
TOTAL BID WITH START DATE OF 6/1/99	$1,000,282.00	

Assumptions

1. Material for the pit perimeter berm can be obtained adjacent to the berm and can be excavated and placed with a trackhoe.
2. Less than 230 cubic yards of rip rap will be required in the drainage channel.
3. The only water that will be required will be for dust control.
4. Seed will be provided by the owner to the site.
5. Tracking with the dozer will be adequate to make the furrows or divots for the seeding.
6. All refuse can be disposed of on site. No hazardous material is on site.
7. Manure to be weed free.

3.0 LABOR RATES AND EQUIPMENT RENTAL RATES FOR CHANGED OR EXTRA WORK

WSMC authorizes the use of the following labor rates and equipment rental rates only as expressly approved by WSMC's Representative. All rates are based upon a 40-hour workweek and include insurance benefits, travel, per diem, taxes, small tools, consumables, overhead, and profit.

3.1 Labor Rates

CLASSIFICATION	BASE HOURLY RATE	OVERTIME RATE
See Attatched Rate Sheet		

3.2 Equipment Rental Rates

MAKE & MODEL	BASE HOURLY RATE	OVERTIME RATE	VINTAGE
See Attatched Rate Sheet			

COMPANY OR SIGNATURE:

FORM OF PROPOSAL

4.0 SUBCONTRACTORS AND SUPPLIES

4.1 The Bidder shall indicate below all of the Work intended to be subcontracted to others.

DESCRIPTION	SUBCONTRACTOR/ADDRESS
All Work will be done in house	

4.2 The Bidder shall indicate below all of the major suppliers of equipment and materials.

DESCRIPTION	SUPPLIER/FABRICATOR
Local farmers for manure	

COMPANY OR SIGNATURE

FORM OF PROPOSAL

5.0 DESIGNATION OF REFERENCES

The following references can attest to the Bidder's knowledge of Conventional Reclamation work, and the abilities and experience of the Bidder's proposed principal representatives:

Company and Job Location	Contact Name & Telephone No.
1. Hecla Mining	Alan Wilson (208)769-4154
2. Jerry Treybig	Treybig Engineering (303) 740-8372
3. U.S. Forest Service	Keith Tweetie (208) 374-5422

6.0 DESIGNATION OF REPRESENTATIVES

6.1. The Bidder designates the following as its principal representative who, on behalf of the Contractor, will complete charge of the Contract.

Name: Eric Robinson

Capacity: Owner

6.2 The Bidder designates the following as its principal representative who, on behalf of the Contractor, will have charge of the Work performed on the site.

Name: To be determined at a later date

Capacity: _____

6.3 The Bidder designates the following as its designated foreman on shifts other than day-shift or in the absence of the principal site representative.

Name: To be determined at a later date.

Capacity: _____

COMPANY OR SIGNATURE

FORM OF PROPOSAL

6.4 The Bidder designates the following as its designated safety representative, who will be in charge of assurance of legal compliance.

Name: Maria Weber

Capacity: Safety Manager

7.0 EXCEPTIONS AND QUALIFICATIONS

Exceptions or qualifications taken by the Bidder to any of the documents furnished with this Invitation, or clarifications to this Proposal shall be stated below and, if none, the Bidder shall state "NONE". (If extensive, submit a detail letter)

This bid is based on the assumptions listed on bid schdule sheet and is only for budget purposed.

COMPANY OR SIGNATURE

RENTAL RATES
EFFECTIVE APRIL 1, 1998

UNIT	WITHOUT OPERATOR
DOZERS	
D9L	$165.00/HR
D9G	$140.00/HR
D9H	$140.00/HR
D8L	$140.00/HR
D8K	$110.00/HR
TD25	$110.00/HR
D6	$ 80.00/HR
JD850	$ 86.00/HR
SCRAPERS	
433B TE PP	$115.00/HR
631C	$135.00/HR
637D TE PP	$165.00/HR
633C WATER WAGON 8000 GAL TANK	$122.00/HR
631D SCRAPER	$150.00/HR
633D CAT SCRAPER	$150.00/HR
PATROLS	
14G W/RIPPER	$ 80.00/HR
14G W/SNOW WING	$ 87.50/HR
16G W/RIPPER	$ 96.00/HR
EXCAVATORS	
HITACHI 200	$ 94.50/HR
CASE 580	$ 43.00/HR
JOHN DEERE 410	$ 43.00/HR
CASE 170	$122.00/HR
CAT 235	$122.00/HR
HITACHI 200 with rock breaker	$145.00/HR
LOADERS	
275C MICHIGAN	$135.00/HR
980C CAT	$109.50/HR
966C CAT	$83.00/HR
2SKDK7 TOYOTA BOB CAT	$37.00/HR
988B CAT LOADER	$145.00/HR

UNITS	WITHOUT OPERATOR
SNOW EQUIPMENT	
966C W/BLOWER	$129.00/HR
TRUCK MOUNTED SNOW PLOW W/SANDER	$60.00/HR
TRUCKS	
ROCK TRUCKS(35 TON)	$119.00/HR
ROCK TRUCKS (35 ton w/ 8,000 gal. water tank)	$119.00/HR
TRACTORS AND 3 AXLE LOWBOY	$90.00/HR
SINGLE AXLE BOOSTER LOAD	$20.00/HR
21 YD. BELLY DUMPS	$50.00/HR
15 YD. END DUMPS	$40.50/HR
WATER TRUCK	$50.00/HR
CREW TRUCK	$24.50/HR
2-AXLE JEEP	$30.00/HR
10 YARD PUP TRAILER	$10.00/HR
MISC.	
HYDRAULIC THUMB ON EXCAVATOR	$10.00/HR
518 CAT SKIDDER W/ GRAPPLES	$78.00/HR
VIBRATORY COMPACTOR-84" RAYGO 600	$70.00/HR
DYNAPAC CT25 COMPACTOR (sheeps foot)	$100.00/HR
STONE RANGER WALK BEHIND	$29.00/HR
BOMAG VIBRATORY COMPACTOR	$64.00/HR
CHAIN SAWS	$40.00/DAY
LIGHT PLANT	$12.00/HR
2" WATER PUMP	$13.00/HR
3" WATER PUMP	$23.00/HR
4" WATER PUMP	$35.00/HR
SUCTION HOSE & DISCHARGE SYSTEM	$15.00/HR
SHEEPS FOOT(PULL TYPE)	$25.00/HR
HAND TAMPER	$15.00/HR
REED SCREEN ALL RD	$75.00/HR
OPERATORS AND LABORERS	
SUPERVISOR	$35.00/HR
OPERATORS	$21.00/HR
LABORERS (Roustabouts & General Labor)	$16.00/HR
SPECIALTY LABOR	$19.50/HR

* Third party handling charge at 10%
* Time and a half will be charged after eight hours per day, Saturdays, Sundays, and major holidays.
* Out of driving range subsistence will be charged at $40.00 per day / per man.
* Rates are subject to change.
* Invoices shall be submitted on a bi-monthly basis and shall be due and payable within 20 days. Late payment shall carry a 1.5% service charge per month.

N. A. DEGERSTROM, INC.
N. 3303 SULLIVAN ROAD — P. O. BOX 425
SPOKANE, WASHINGTON 99210

MINE SERVICE DIVISION
Wash. Cont. Lic. No. DE-GE-RN-A375NO

(509) 928-3333

March 24, 1999

Mr. James Ashton
WESTERN STATES MINERALS CORPORATION
250 South Rock Blvd., Suite 130
Reno, Nevada 89502

Re: BID PROPOSAL:
DRUM MINE RECLAMATION

Dear Mr. Ashton:

Thank you for the opportunity of quoting your mine reclamation project near Delta, Utah. It is our hope to do the work for you.

The objective of the work would be to complete the projects as discribed in your Bid Proposal during the late summer or early fall with the highest degree of quality possible and with the best owner/contractor relationship. N. A. Degerstrom, Inc. prides itself on both of these items.

Your two month window to complete the work is tight, but probably workable. It would be our plan to mobilize in the equipment, set-up fuel and water facilities, pickup debris and bury in landfill, remove the topsoil from the borrows and stockpile with our 988B loader and 773B haul trucks, slope the dumps with our D10N and D8N dozers, build ditches and berms with our 235B hoe, fill ponds, breakup concrete, place topsoil and compost, and seed. The time line would be the two months.

We are planning to purchase fuel and manure from local Delta suppliers.

If you have any further questions, please call.

Sincerely,

N. A. DEGERSTROM, INC.

Paul Hatfield
Vice President-Mining

PAH/dm

WESTERN STATES MINERALS CORPORATION

FORM OF PROPOSAL

TO: WESTERN STATES MINERALS CORPORATION

CARE OF: 250 SOUTH ROCK BLVD., SUITE 130
Reno, Nevada 89502
(775) 856-3339
ATTENTION: James Ashton

SUBJECT: BID PROPOSAL: DRUM MINE - RECLAMATION

The undersigned Bidder certifies that it has examined the Request for Contract Bid and all attachments listed therein for the above subject Contract. That it has checked all prices shown in this Bid document and understands that Western States Minerals Corporation (WSMC) will not be responsible for any errors or omissions made by the Bidder in the preparation of this Proposal.

It is understood that this Proposal constitutes a preliminary offer, which represents their best estimate of the work to be completed. It is further understood that the prices quoted herein will not be subject to any adjustment for escalation.

The Bidder agrees that the Contract Documents included with the Bid, a copy each of which have been furnished to the Bidder by WSMC's Engineer, are the basis for this Bid.

This Bid Proposal acknowledges receipt, understanding, and full consideration of the following addenda: NONE (if no addenda have been received, state "None").

WESTERN STATES MINERALS CORPORATION

FORM OF PROPOSAL

Table of Contents

FORM OF PROPOSAL

1.0 PREAMBLE BY WSMC

1.1 A Proposal to be fully responsive must include a price for each item of Section 2.0, BID SCHEDULE, quoted and a reply to each subsequent section of the Proposal.

1.2 It will also be considered by WSMC that the Bidder has made allowances in its prices for the entire cost requirement of the Contract Specifications, General Specifications, Drawings, and other Contract Documents.

1.3 The Bidder shall submit, in Section 2.0; BID SCHEDULE. the total bid and unit prices for each item of Work.

1.4 The rates quoted under Section 3.0; LABOR RATES AND EQUIPMENT RENTAL RATED - CHANGED OR EXTRA WORK. of the Proposal will be used for work outside of the scope of the Contract and for which price cannot be established. Whenever possible, these rates and the supplementary unit prices will be used to negotiate a Lump Sum amount. However, on an emergency basis, changed or extra work may be performed on a time-and-materials basis using these rates and unit costs under Work authorization procedures.

1.5 The Bidder shall submit the following attachments with the Proposal:

1.5.1 A brief statement of the project goals and the approach to be used in fulfilling them.

1.5.2 A brief description of how the Work requested will be completed, the outline of field procedures, the equipment which will be utilized, and the work schedule which will be employed, e.g. a time line of the tasks with start time, duration, and finish time.

1.5.3 A complete Staff Organization Chart; including Project Manager, Field Engineers, Safety Coordinator, Office personnel, and other key employees.

1.5.4 A brief resume for each key employee named on the Staff Organization Chart. WSMC reserves the right to request replacement of any candidate offered.

2.0 BID SCHEDULE

The Bidder proposes to conduct the reclamation of the Drum Mine Site in accordance with the Contract Specification and the Drawings for the following prices:

ITEM DESCRIPTION	TOTAL PRICE	UNIT PRICE
DISPOSE OF ALL REMAINING REFUSE	$ 4,250	$ 425.00
SALVAGE GROWTH MEDIA	$ 37,025	$ 3,020.00
CONTOUR HEAPS, WASTE DUMP, MISC.	$ 147,105	$ 0.35
RIP COMPACTED AREAS	$ 7,130	$ 128.00
HAUL AND SPREAD GROWTH MEDIA	$ 185,504	$ 1.36
ESTABLISH DRAINAGE CHANNELS	$ 62,400	$ 12.00
CONSTRUCT PIT PERIMETER BERMS	$ 70,000	$ 10.00
FILL AND CONTOUR PROCESS PONDS	$ 69,300	$ 1.05
REMOVE OLD CONCRETE FOUNDATIONS	$ 11,475	$ 2.55
SCARIFY REMAINING COMPACTED AREAS	$ 8,775	$ 195.00
HAUL AND SPREAD MANURE	$ 16,256	$ 64.00
BROADCAST SEED ALL RECLAIMED AREAS	$ 38,100	$ 150.00
MOBILIZATION/DEMOBILIZATION	$ 90,000	90,000.00
TOTAL BID	$ 747,320	$ --

3.0 LABOR RATES AND EQUIPMENT RENTAL RATES FOR CHANGED OR EXTRA WORK

WSMC authorizes the use of the following labor rates and equipment rental rates only as expressly approved by WSMC's Representative. All rates are based upon a 40-hour workweek and include insurance benefits, travel, per diem, taxes, small tools, consumables, overhead, and profit.

3.1 Labor Rates

CLASSIFICATION	BASE HOURLY RATE	OVERTIME RATE
Foreman	$50.00	$68.00
Operator	$28.00	$46.00
Truck Driver	$27.00	$45.00
Mechanic	$40.00	$58.00
Laborer	$26.00	$44.00

3.2 Equipment Rental Rates (with operator)

MAKE & MODEL	BASE HOURLY RATE	OVERTIME RATE	VINTAGE
988B Loader	$140	$158	1988
235B Hoe	$135	$153	1999
773B Truck	$145	$163	1980-1982
4000-gal. water tk.	$ 85	$103	1978
16G Blade	$105	$123	1978
D10N Dozer	$180	$198	1987
D8N Dozer	$130	$148	1990
950 Loader	$ 75	$ 93	1978

COMPANY OR SIGNATURE:

N. A. DEGERSTROM, INC.

4.0 SUBCONTRACTORS AND SUPPLIES

4.1 The Bidder shall indicate below all of the Work intended to be subcontracted to others.

DESCRIPTION	SUBCONTRACTOR/ADDRESS
Haul Manure	Ruby Dome Construction C/O Steve Dosa 6525 East Idaho Street Elko, NV 89801

4.2 The Bidder shall indicate below all of the major suppliers of equipment and materials.

DESCRIPTION	SUPPLIER/FABRICATOR
Fuel	Sperry Oil Delta, UT

COMPANY OR SIGNATURE
N. A. DEGERSTROM, INC.

5.0 DESIGNATION OF REFERENCES

The following references can attest to the Bidder's knowledge of Conventional Reclamation work, and the abilities and experience of the Bidder's proposed principal representatives:

Company and Job Location	Contact Name & Telephone No.
1. Western Nuclear Jeffrey City, WY	John Gearhart, Manager, (307) 544-2291
2. BHP-Robinson Ely, NV	Russ Kliche, Sr. Engineer, (702) 289-7209
3. Florida Canyon Imlay, NV	R. Cory Atiyer, Superintendent, (702) 538-7300

6.0 DESIGNATION OF REPRESENTATIVES

6.1 The Bidder designates the following as its principal representative who, on behalf of the Contractor, will complete charge of the Contract.

Name: Paul Hatfield

Capacity: Vice President - Mining

6.2 The Bidder designates the following as its principal representative who, on behalf of the Contractor, will have charge of the Work performed on the site.

Name: Matt Coffin

Capacity: Superintendent

6.3 The Bidder designates the following as its designated foreman on shifts other than day-shift or in the absence of the principal site representative.

Name: NONE

Capacity: _____

COMPANY OR SIGNATURE
N. A. DEGERSTROM, INC.

FORM OF PROPOSAL

6.4 The Bidder designates the following as its designated safety representative, who will be in charge of assurance of legal compliance.

Name: Don Miller

Capacity: Safety Manager

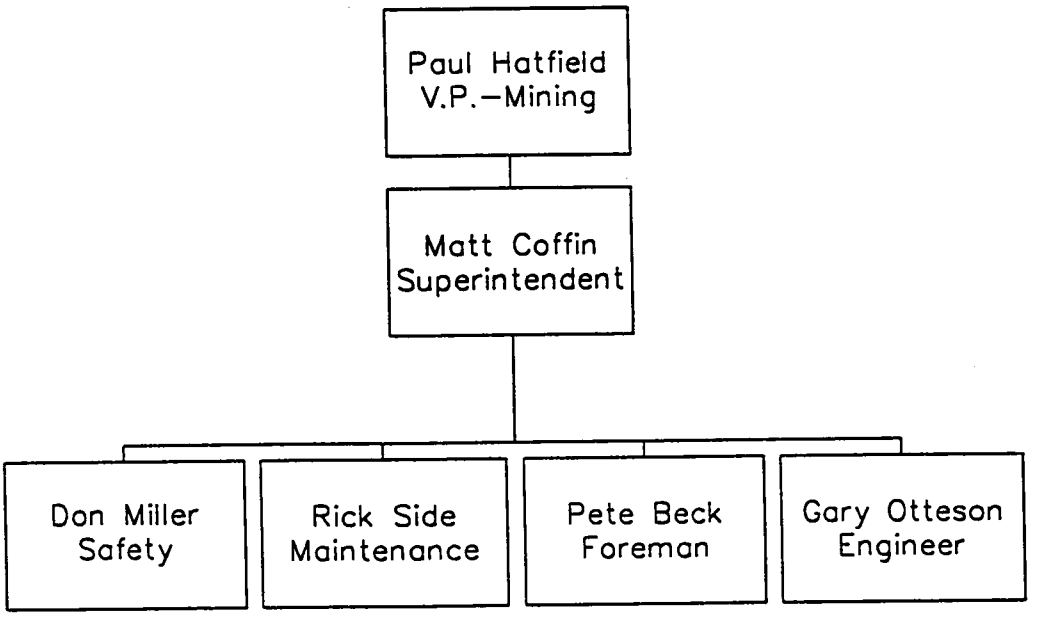
7.0 EXCEPTIONS AND QUALIFICATIONS

Exceptions or qualifications taken by the Bidder to any of the documents furnished with this Invitation, or clarifications to this Proposal shall be stated below and, if none, the Bidder shall state "NONE". (If extensive, submit a detail letter)

NONE

COMPANY OR SIGNATURE

N. A. DEGERSTROM, INC.



N.A. Degerstrom, Inc.

DRUM MINE RECLAMATION

March 26, 1999

MATTHEW COFFIN

1005 Highland Drive, Elko, NV 89801 (702)753-7812

QUALIFICATIONS

- Seventeen years experience in the mining and construction field. including equipment operator, surveyor, foreman, and general foreman.
- Certified MSHA instructor, First Aid, and CPR
- Outstanding employment record. Long standing foreman and equipment operator at N. A. Degerstrom.
- Ability to communicate with management from the field.
- Skilled at independent problem solving and follow through.

SKILLS

Operator. Extensive experience operating numerous dozers, loaders, blades, excavators, and front end shovels.

Production Foreman. In charge of day to day operations including: safety, job prioritization, quality control, manpower scheduling, equipment utilization, and communication between contractor and operator.

EXPERIENCE

General Foreman. Foreman. Operator. N. A. Degerstrom, Spokane , WA (1987-Present)
- Operator. Toyaibe, NV
- Operator/Leadman. Getchell, Golconda, NV
- Foreman. Battle Mountain, NV
- Foreman. Santa Fe Pacific Gold, Twin Creeks Mine, Golconda, NV
- Foreman. Merit Consultants, Santa Fe Pacific Gold, Twin Creeks Mine, Golconda, NV
- General Foreman. Santa Fe Pacific Gold, Twin Creeks Mine, Golconda, NV
- General Foreman. Merit Consultants, Santa Fe Pacific Gold, Twin Creeks Mine, Golconda, NV

Operator/Survevor. Dee Gold, Elko, NV. Operated dozer, loader, blade, and excavator. Operated instrument in mine surveys. Performed all mine blast procedures.

General Contractor. Self Employed. Seattle, WA.

Survevor. Western States Minerals, Elko, NV. Operated instrument and directed rod persons in mine, construction, and exploration surveys. Calculated production tonnage. Performed all mine blast procedures.

Survevor. Boyack Surveying. Elko, NV. Operated instrument for claim staking, site development, subdivisions, mine and mill sites, and water rights.

References

Bill Humphrys
Santa Fe Pacific Gold
Twin Creeks Mine
(702)635-4465

Lyle Avie
Santa Fe Pacific Gold
Twin Creeks Mine
(702)635-4466

PERSONAL RESUME

PETER BECK
26 Rams Horn Street
Dillon, Montana 59725
406-683-2914
406-660-1930

Education

Hazmat Training Course-Worksafe Inc.

Blast Dynamics Blasting Seminar-Vibratec, Inc.

Montana Blasters Licensing Seminar (Atlas Powder)

ISEE Member & Charter Member of Rocky Mountain Chapter of Explosives Engineers, Attended numerous blasting seminars & chapter meetings

Extensive safety training - N. A. Degerstrom, Inc., CPR & First Aid

School of Engineering; Montana State University, Bozeman

Computer Fundamentals & Micros at the Butte High School Adult Education System

Montana High School Diploma: Powell County High School, Deer Lodge, Montana

Montana Blasters License 1st Class
Experienced in job start-up, permitting, scale distances, mine de-watering, water well drilling, pump installation and service, and most importantly, Safety. All aspects of open pit mining, specializing in blasting & blast hole drilling.

Work History

03/98 to current	N. A. Degerstrom, Inc.; Regal Mine, Barretts Minerals Project Superintendent 26 Rams Horn Street Dillon, Montana 59725
11/97 to 03/98	Coleman Construction Rock Crusher, Equip Oper, Welder, Mechanic,Carpenter 2600 Webster Lane Dillon, Montana 59725

01/97 to 10/97	N. A. Degerstrom, Inc.; Treasurer Mine Project Regal Mine BMI Drill & Blast Supervisor Paul Baker; Superintendent 610 N. Montana Dillon, Montana 59725
02/95 to 02/96	Beck Drilling & Pump Water Well Driller & Pump Technician 206 Greenhouse Road Deer Lodge, Montana 59722
06/94 to 12/94	N. A. Degerstrom, Inc.; Basin Creek Mine Mechanic, Equipment Operator, Truck Driver George Heath, Superintendent
11/93 to 06/94	N. A. Degerstrom, Inc.; Anaconda, Montana Anaconda Superfund Cleanup Screen Plant Supervisor, Equipment Operator, Grade Setter Paul Baker, Superintendent
02/92 to 11/93	N. A. Degerstrom, Inc.; Anaconda, Montana Beal Mtn. Mine; Anaconda, Montana Drill & Blast Supervisor Paul Baker, Superintendent
08/88 to 02/92	N. A. Degerstrom, Inc.; Anaconda, Montana Drill-Powderman, Beal Mtn; Anaconda, Montana Paul Kunze, Drill & Blast Superintendent
01/74 to 01/76	O'Keefe Drilling Company Driller, Driller's Helper Edward O'Keefe CEO Butte, Montana

PERSONAL RESUME

GARY A. OTTESON
554 E. Haskell Apt. D
Winnemucca, NV 89445
775-625-2326

Education

01-12	Completed in public school system Spokane, Washington
College	Eastern Washington University Cheney, Washington B.S. Degree in Geology, 1975.

Work History

08/81-present	N. A. Degerstrom, Inc. Controller Responsible for submitting monthly applications for payment at various company projects. Coordinating with the various owner management people to make sure all parties agree to charges, including aerial surveys, changes in conditions, daily truck counts, force account work, and work outside the scope of contract. Also, gather and coordinate data as needed.

References

John Gearhart
Western Nuclear, Inc.
Jeffrey City, WY 82310
307-544-2291

Walter Dzick
Getchell Gold Corporation
Golconda, NV 89414
775-635-5001

APPENDIX G

Alto Pit and Haul Road Contract Reclamation

CONTRACT RECLAMATION WORK TO BE PERFORMED FOR THE ALTO PIT AND ASSOCIATED HAUL ROAD

This Appendix G sets out the contractual agreement whereby Western States Minerals Corporation (WSMC) agrees to perform specified reclamation tasks on behalf of the BLM and DOGM in the area known as Alto Pit and the associated haul road. The Alto Pit was mined by JUMBO Mining Company, and the associated haul road was constructed by that same company. That company has declared bankruptcy and defaulted on its reclamation obligations. WSMC has never claimed any mineral rights, nor conducted any exploration or other mining activities on these sites, and has no preexisting reclamation obligations with regard to them. In the event that the BLM and/or DOGM obtain timely landowner and/or claimholder consents to conduct the activities set out herein, WSMC will perform the tasks itemized below concurrently with the Drum Mine reclamation. If such consents are not timely obtained, or if any other legal impediment to performance of the contractual work set out herein arises, then WSMC shall have no obligation to perform any of the work set out on this Appendix G.

If no legal bar exists to performing the work at the same time as WSMC conducts reclamation work on the Drum mine site, WSMC will act as a contractor for the Bureau of Land Management (BLM) and the Utah Division of Oil, Gas and Mining (DOGM) in performing the following tasks for the two areas mentioned.

ALTO PIT

The Alto Pit area encompasses approximately three (3) acres. The site is located on the top of a mountain at an elevation of roughly 6,680 feet (AMSL) in section 36 of Township 14 south, Range 11 west and approximately 2.5 miles northwest of the Drum Mine (Figure G-1, Alto Road and Site).

WSMC will contour the area to blend, as best as practicable, into the surrounding area, in accordance with field instructions received from DOGM and/or BLM. The mine contains broken rock that was blasted and never mucked along with a small ramp for access. A berm will be left on the outer edge of the area as a safety precaution. The pit road will be scarified and blocked off leaving large boulders to give the appearance of a "moonscape". The area will then be lightly ripped along contour and seeded. The seed mix will be the same as that proposed for the Drum Mine and applied by broadcasting. No topsoil, fertilizer or bio-solids will be applied to the site.

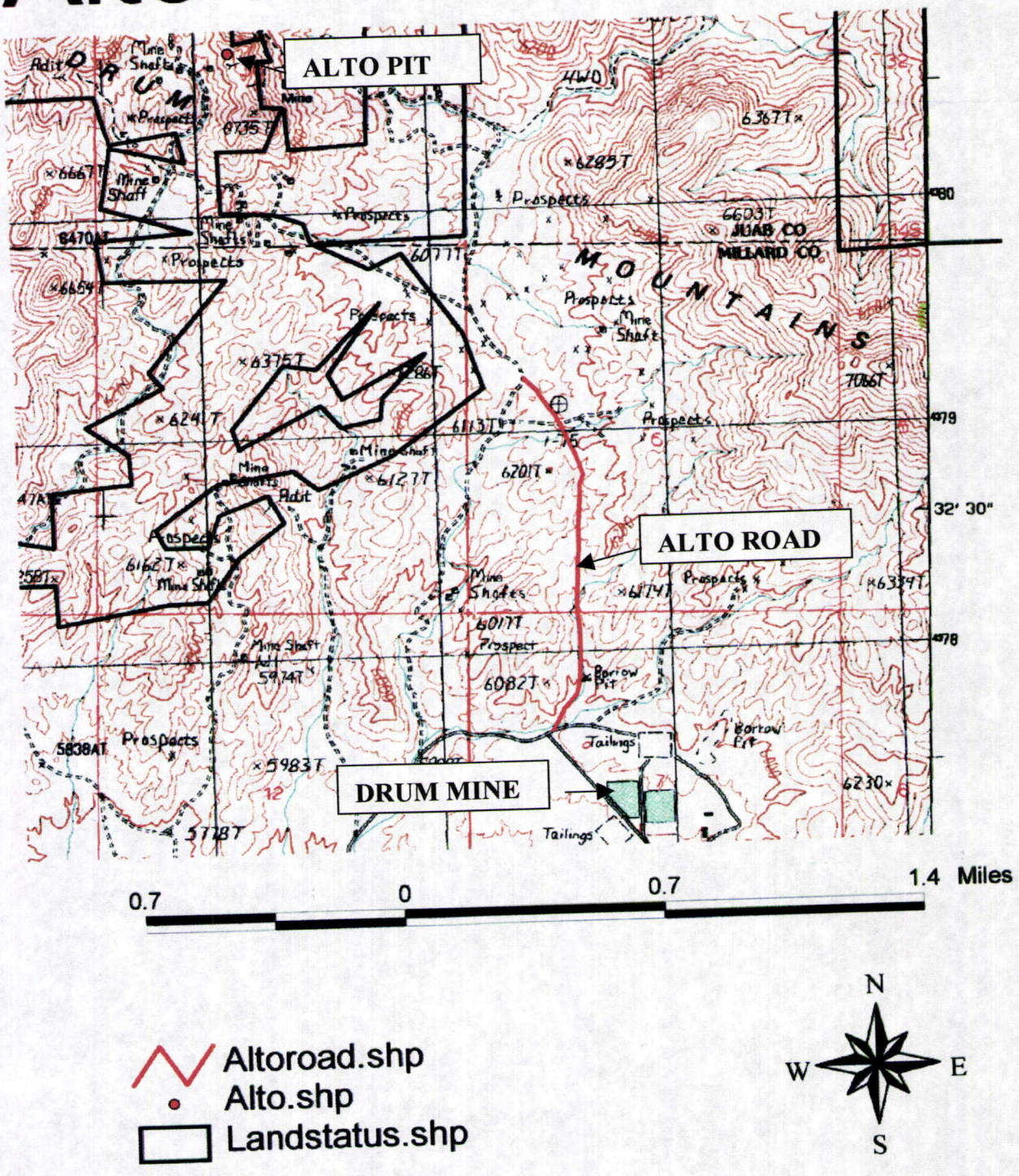
HAUL ROAD

The haul road is approximately one mile in length; of which, only an estimated 3,000 feet will be reclaimed. The road is located adjacent to the Drum Mine and is roughly fifteen (15) feet wide (Figure G-1, Alto Road and Site).

WSMC will block the road at specified locations using nearby boulders and berm material. The remaining road between the blockages will be scarified and the berm will be pulled back where it is feasible. Only minor contouring will take place on some of the larger road cuts. Seed will be broadcast over the area once the earthwork is completed. No topsoil, fertilizer or bio-solids will be applied to the reclaimed road.

FIGURE G-1

Alto Road and Site



This page is a reference page used to track documents internally for the Division of Oil, Gas and Mining

Mine Permit Number M0270007 Mine Name Drum Mine
Operator Western States Minerals Date 12-14-1999
TO _____ FROM _____

__CONFIDENTIAL __BOND CLOSURE __LARGE MAPS X EXPANDABLE
__MULTIPUL DOCUMENT TRACKING SHEET __NEW APPROVED NOI
__AMENDMENT _OTHER _____

Description YEAR-Record Number

__NOI X Incoming __Outgoing __Internal __Superceded

Reclamation & Closure Plan

___NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__NOI __Incoming __Outgoing __Internal __Superceded

__TEXT/ 81/2 X 11 MAP PAGES __11 X 17 MAPS __LARGE MAP

COMMENTS: _____

CC: _____